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UNITED STATES PATENT AND TRADEMARK OFFICE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Apr. 13, 1984. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of May 1984

Affirmed	212
Affirmed in Part	18
Reversed	69
Total	299

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,319,648, Re. S.N. 598,189, Filed Apr. 9, 1984, Cl. 175/053, PROCESS FOR DRILLING UNDERGROUND ARCUATE PATHS AND INSTALLING PRODUCTION CASINGS,CONDUITS, OR FLOW PIPES THEREIN, Martin D. Cherrington, Owner of Record: *Inventor,* Attorney or Agent: Ned L. Conley, et al., Ex. Gp.: 356

4,327,496, Re. S.N. 604,685, Filed May 27, 1984, Cl. 33/180R, ADJUSTABLE LINK-TYPE INSERTION COMPLIANCE DEVICE, Jack Rebman, Owner of Record: *Lord Corp., Erie, Pa.,* Attorney or Agent: Joseph H. Head, Ex. Gp.: AU 246

4,329,089, Re. S.N. 600,895, Filed Mar. 26, 1984, Cl. 405/262, METHOD AND APPARATUS FOR RETAINING EARTHEN FORMATIONS THROUGH MEANS OF WIRE STRUCTURES, William K. Hilfiken, et al., Owner of Record: *Hilfiken Pipe Co., Eureka, Calif.,* Attorney or Agent: Karl A. Limbach, et al., Ex. Gp.: 351

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue

Department of Commerce
Patent and Trademark Office
37 CFR Part 2
Docket No. 40557–4057
Miscellaneous Amendments of Trademark Rules

Agency: Patent and Trademark Office, Commerce.

Action: Proposed rulemaking.

Summary: The Patent and Trademark Office proposes amendments to the rules of practice in trademark cases to correct two cross-references and a spelling error; to bring §§2.104 and 2.112(a) into conformity with §§13 and 14 of the Trademark Act; to make §2.114(c), which relates to the withdrawal of a petition for cancellation, consistent with corresponding §2.106(c), which relates to the withdrawal of an opposition; and to specify that the Trademark Trial and Appeal Board may, in its discretion, grant a §2.132(a) motion even if the motion was filed after the opening of the testimony period of the moving party.

Date: Written comments by July 18, 1984.

Address: Address written comments to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Written comments will be available for public inspection in Room 11E10 of Bldg. 3, Crystal Plz., 2021 Jefferson Davis Hwy., Arlington, Va.

For Further Information Contact: Miss Janet E. Rice by telephone at (703) 557-3551 or by mail addressed to the Commissioner of Patents and Trademarks, Attention: Miss Janet E. Rice, Crystal Sq. 5, Suite 1008, Washington, D.C. 20231.

Supplementary Information: Several of therules of practice in trademark cases were amended, effective Feb. 27, 1983, by a final rule notice published in the *Federal Register* on Jan. 28, 1983 at 48 FR 3972 and in the *Official Gazette* of Feb. 22, 1983 at 1027 O.G. 129. A substantial number of other rules of practice in trademark cases were amended, effective June 22, 1983, by a final rule notice published in the *Federal Register* on May 23, 1983 at 48 FR 23122 and in the *Official Gazette* of June 21, 1983 at 1031 O.G. 13. As a result of these rule amendments, three further rule amendments of a "housekeeping" nature are now necessary. First, because the rule amendments included changes in some section numbers and in the location of some provisions, the cross-refer-

ence portions of §§2.1 and 2.145(d) (1) need to be corrected. Second, §2.101(b), as amended effective Feb. 27, 1983, contains a spelling error which needs to be corrected. Third, §2.114(c), which relates to the withdrawal of a petition for cancellation, needs to be amended so that it will be consistent with §2.106(c), as amended effective June 22, 1983, which relates to the withdrawal of an opposition.

Additionally, §2.104 (which lists the content requirements for an opposition) and §2.112(a) (which lists the content requirements for a petition for cancellation) are proposed to be amended to bring them into conformity with §§13 and 14 of the Trademark Act. These amendments are proposed as a result of a comment contained in the recent case of *Selva & Sons, Inc.* v. *Nina Footwear, Inc.*, 705 F.2d 1316, 217 USPQ 641 (CAFC 1983). The comment, which appears in footnote 6 at page 648, reads as follows:

> 37 CFR 2.112 commands that a petition for cancellation "set forth a short and plain statement showing how the petitioner is or will be damaged by the registration." This directive is not, however, reflective of 15 USC 1064, which states that a petition to cancel the registration of a mark may be filed "by any person who *believes* that he is or will be damaged by the registration." (Emphasis ours.) Nor is it consistent with recent case law, discussed infra.

Finally, §2.132, as amended effective June 22, 1983, permits any party in the position of defendant to file a motion to dismiss for failure to take testimony where plaintiff has either (1) failed to take testimony or offer any other evidence (§2,132(a)) or (2) offered no evidence other than copies of Patent and Trademark Office records and such evidence is insufficient to show that upon the law and the facts plaintiff is entitled to relief (§2.132(b)). Paragraph (c) of the section, adopted effective June 22, 1983, provides that any motion filed under paragraph (a) or (b) must be filed before the opening of the testimony period of the moving party. However, in those cases where a plaintiff's testimony period has expired and plaintiff has in fact failed to take testimony or offer any other evidence in his behalf, it is in the interests of justice and judicial economy to grant a motion to dismiss under §2.132(a) even if the motion was not filed until after the opening of the defendant's testimony period. Accordingly, the Patent and Trademark Office proposes to amend Rule 2.132(c) to specify that the Trademark Trial and Appeal Board may grant such a motion even if the motion was not filed until after the opening of the testimony period of the moving party.

Discussion of Specific Sections Changed:

The rules for which amendments are proposed are discussed below. [The designation § is used in the Code of Federal Regulations to denominate a rule. If internal division of a section is necessary, it is divided into paragraphs designated as follows: "a", "b", etc. at the first level; "1", "2", etc. at the second level; and "i", "ii", etc. at the third level.]

Section 2.1 provides in part that §§1.1 to 1.26 of Part I of Title 37 of the Code of Federal Regulations are applicable to trademark cases except such parts thereof which specifically refer to patents and except §1.22 to the extent that it is inconsistent with §§2.85(e), 2.101(c) or 2.162(d). The provisions which formerly appeared in §2.101(c) now appear, in modified form, in §2.101(d), as amended effective Feb. 27, 1983. Further, the provisions contained in §2.111(c), adopted effective Feb. 27, 1983, serve to amplify that part of §2.85(e) which relates to petitions for cancellation. Accordingly, it is proposed to amend the cross-reference portion of §2.1 by changing "§2.101(c)" to "§2.101(d)" and by adding a cross-reference to §2.111(c).

Section 2.101(b) is proposed to be amended by changing the spelling of the word "Principle" to "Principal".

Section 2.104 is proposed to be amended by deleting the requirement that the opposition "set forth a short and plain statement showing how the opposer would be damaged by the registration of the opposed mark" and substituting therefor a requirement that the opposition "set forth a short and plain statement showing why the opposer believes he would be damaged by the registration of the opposed mark." The proposed substitute requirement is in conformity with Section 13 of the Trademark Act, which states that any person "who believes that he would be damaged by the registration of a mark upon the principal register" may file an opposition in the Patent and Trademark Office.

Section 2.112(a) is proposed to be amended by deleting the requirement that the petition to cancel "set fortha short and plain statement showing how the petitioner is or will be damaged by the registration" and substituting therefor a requirement that the petition to cancel "set forth a short and plain statement showing why the petitioner believes he is or will be damaged by the registration." The proposed substitute requirement is in conformity with Section 14 of the Trademark Act, which states that a petition to cancel the registration of a mark may be filed "by any person who believes that he is or will be damaged by the registration."

Section 2.114(c), which now provides in part that after an answer to a petition for cancellation is filed the petition may not be withdrawn without prejudice except with the consent of the registrant, is proposed to be amended to require the *written* consent of the registrant. The proposed requirement is in conformity both with the existing practice under §2.114(c) and with §2.106(c), which, as amended effective June 22, 1983, provides in part that after the answer to an opposition is filed, the opposition may not be withdrawn without prejudice except with the written consent of applicant.

Section 2.132(c), which now provides that any motion filed under paragraph (a) or (b) of the section must be filed before the opening of the testimony period of the moving party, is proposed to be amended to specify that the Trademark Trial and Appeal Board may in its discretion grant a motion filed under paragraph (a) even if the motion was filed afterthe opening of the testimony period of the moving party.

Section 2.145(d) (1), which governs the time for filing an appeal to the U.S. Court of Appeals for the Federal Circuit or for commencing a civil action, now provides in part that if a request for rehearing or reconsideration or modification of the decision is filed within the time specified in §2.129(c) or §2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire at the end of the sixty day period or thirty days after action on the request, whichever is later. Prior to June 22, 1983, §2.129(c) governed the filing of any request for rehearing or reconsideration or modification of a decision of the Trademark Trial and Appeal Board, including a decision on a motion which is finally dispositive of a case. However, under the trademark rules as amended effective June 22, 1983, a request for rehearing or reconsideration or modification of a decision issued after final hearing is governed by §2.129(c), but a request for rehearing, etc., of a decision on a motion which is finally dispositive of a case is governed by §2.127(b). Accordingly, §2.145(d) (1) is proposed to be amended to include a cross-reference to §2.127(b).

Environmental, energy, and other considerations: The proposed rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The proposed rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Public Law 96-354). The rule change includes no additional or increased fees. Substantive rights to use valuable trademarks are not adversely affected.

This proposed rule change does not contain a collection of information requirement under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Or-

der 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. There will be no significant, adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States based enterprises to compete with foreign based enterprises in domestic or export markets.

List of Subject Terms in 37 CFR Part 2:

Administrative practice and procedures, Courts, Lawyers, Trademarks.

Notice is hereby given that pursuant to the authority contained in Section 41 of the Trademark Act of July 5, 1946, as amended, the Patent and Trademark Office proposes to amend Part 2 of Title 37 of the Code of Federal Regulations by amending §§2.1, 2.101, 2.104, 2.112, 2.114, 2.132,and 2.145 as set forth below. Additions are indicated by arrows and deletions by brackets.

Part 2—Rules of Practice in Trademark Cases

1. Section 2.1 is proposed to berevised to read as follows:

§2.1 Sections of Part 1 applicable.

Sections 1.1 to 1.26 of this chapter are applicable to trademark cases except such parts thereof which specifically refer to patents and except §1.22 to the extent that it is inconsistent with §§2.85(e), ► 2.101(d), ◄ [2.101(c) or] ► 2.111(c) or ◄ §2.162(d). Other sections of Part 1 incorporated by reference or referred to in particular sections of this part are also applicable to trademark cases.

2. Section 2.101 is proposed to be amended by revising paragraph (b) to read as follows:

§2.101 Filing an opposition.

* * * * *

(b) Any person who believes that he would be damaged by the registration of a mark on the ► Principal ◄ [Principle] Register may oppose the same by filing an opposition which should be addressed to the Trademark Trial and Appeal Board.

* * * * *

3. Section 2.104 is proposed to be revised to read as follows:

§2.104 Contents of opposition.

The opposition must set forth a short and plain statement showing ► why the opposer believes he ◄ [how the opposer] would be damaged by the registration of the opposed mark and state the grounds for opposition. A duplicate copy of the opposition, including exhibits, shall be filed with the opposition.

4. Section 2.112 is proposed to be amended by revising paragraph (a) to read as follows:

§2.112 Contents of petition for cancellation.

(a) The petition to cancel must set forth a short and plain statement showing ► why the petitioner believes he ◄ [how the petitioner] is or will be damaged by the registration, state the grounds for cancellation, and indicate the respondent party to whom notification shall be sent. A duplicate copy of the petition, including exhibits, shall be filed with the petition.

* * * * *

5. Section 2.114 is proposed to be amended by revising paragraph (c) to read as follows:

§2.114 Answer.

* * * * *

(c) The petition for cancellation may be withdrawn without prejudice before the answer is filed. After the answer is filed ►, ◄ the petition may not be withdrawn without prejudice except with the ► written ◄ consent of the registrant.

6. Section 2.132 is proposed to be amended by revising paragraph (c) to read as follows:

§2.132 Involuntary dismissal for failure to take testimony.

* * * * *

(c) ► A ◄ [Any] motion filed under paragraph (a) or (b) of this section must be filed before the opening of the testimony period of the moving party ►, ◄ [.] ► except that the Trademark Trial and Appeal Board may in its discretion grant a motion under paragraph (a) even if the motion was filed after the opening of the testimony period of the moving party. ◄

7. Section 2.145 is proposed to be amended by revising paragraph (d) (1) to read as follows:

§2.145 Appeal to court and civil action.

* * * * *

(d) Time for appeal or civil action. (1) The time for filing the notice of appeal to the U.S. Court of Appeals for the Federal Circuit (paragraph (b) of this section), or for commencing a civil action (paragraph (c) of this section), is sixty days from the date of the decision of the Trademark Trial and Appeal Board or the Commissioner, as the case may be. If a request for rehearing or reconsideration[,] or modification of the decision [,] is filed within the time specified in ► §§2.127(b), ◄ [§] 2.129(c) or [§] 2.144, or within any extension of time granted thereunder, the time for filing an appeal or commencing a civil action shall expire at the end of the sixty day period or thirty days after action on the request, whichever is later. The sixty and thirty day periods may be extended by the Commissioner upon a showing of sufficient cause.

* * * * *

May 3, 1984.

GERALD D. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of July 3, 1984

Re. 31,489	4,394,743	4,418,318	4,428,743
4,146,088	4,396,533	4,418,388	4,429,725
4,232,501	4,398,063	4,418,509	4,430,195
4,243,509	4,398,921	4,419,667	4,430,793
4,251,820	4,400,303	4,421,096	4,431,276
4,278,469	4,401,027	4,422,442	4,432,083
4,286,105	4,402,243	4,422,526	4,432,948
4,302,284	4,402,444	4,423,254	4,433,246
4,314,868	4,403,523	4,423,333	4,433,901
4,330,998	4,404,247	4,423,377	4,434,040
4,340,538	4,404,361	4,424,021	4,434,476
4,346,061	4,404,966	4,424,630	4,434,928
4,361,855	4,408,324	4,424,743	4,435,121
4,366,423	4,408,549	4,425,142	4,436,318
4,367,094	4,411,795	4,425,409	4,436,792
4,379,376	4,412,291	4,425,774	4,436,857
4,381,766	4,413,183	4,425,874	4,437,955
4,382,342	4,413,295	4,426,180	4,438,009
4,382,467	4,413,732	4,426,294	4,439,174
4,383,868	4,415,903	4,426,334	4,440,088
4,387,449	4,416,599	4,427,135	4,442,447
4,393,032	4,416,765	4,427,592	4,442,508
4,393,634	4,417,594	4,428,186	

Disclaimers

3,470,221.—*Rajendra Nath Chadha,* Ann Arbor and *Kailash Chandra Pande,* Adrian, Mich. DIORGANO-(ALKOXY) TIN HALIDES. Patent dated Sept. 30, 1969. Disclaimer filed Apr. 9, 1984, by the assignee, *SWS Silicones Corp.*

Hereby enters this disclaimer to all claims of said patent.

4,109,828.—*Maurice M. Stewart,* West Bloomfield, Mich. INHALATION APPARATUS. Patent dated Aug. 29, 1978. Disclaimer filed May 14, 1984, by the assignee, *Oxygen Therapy Institute, Inc.*

Hereby enters this disclaimer to all claims of said patent.

4,211,426.—*Wallace M. Motlich,* Menlo Park, Calif. WEIGHT RELIEVING AMBULATOR. Patent dated July 8, 1980. Disclaimer filed May 17, 1984, by the assignee, *Everest & Jennings, Inc.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5 and 10 of said patent.

Dedications

3,648,929.—*Andre Corbaz,* Geneva, Switzerland. ATOMIZER. Patent dated Mar. 14, 1972. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,857,470.—*Gilbert Bastard,* Onex, Geneva; *Michel Moulin,* Lausanne, both of Switzerland. PRINTER FOR ALPHANUMERIC CHARACTERS. Patent dated Dec. 31, 1974. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,881,945.—*Felix J. Trojer; Grahame P. O'Connor,* both of Grand-Lancy/Geneva; *Helmut Tannenberger,* Geneva, all of Switzerland. GLASS FIBER OF HIGH MODULUS OF ELASTICITY AND PROCESS FOR MANUFACTURING IT. Patent dated May 6, 1975. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,883,338.—*Valentin Stingelin,* Aire/Geneva, Switzerland. PROCESS AND APPARATUS FOR THE PRODUCTION OF SHEET GLASS. Patent dated May 13, 1975. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,885,063.—*Herbert Schachner; Helmut Tannenberger; Bastian O. Baumberger,* Geneva, Switzerland. PROCESS FOR PROTECTING A METTALLIC SURFACE AGAINST CORROSION AND WEAR. Patent dated May 20, 1975. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,885,944.—*Valentin Stingelin,* Aire Ge, Switzerland. METHOD OF MAKING SHEET GLASS. Patent dated May 27, 1975. Dedication filed Mar. 26, 1984, by the assignee, *Battelle Memorial Institute.*

Hereby dedicates to the People of the United States the entire remaining term of said patent.

3,929,111.—*Robert K. Turner,* Waukegan; *Edgar Rose,* Glencoe, Ill. FUEL FEED SYSTEM FOR RECYCLING FUEL. Patent dated Dec. 30, 1975. Dedication filed Apr. 10, 1984, by the assignee, *Outboard Marine Corp.*

Hereby dedicates to the Public the remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public L ibrary	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6670
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas.	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF June 9, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-21-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	9-30-82
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-21-83
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SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	8-25-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-24-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-29-82
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SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340 13 D. J. STOCKING, Director	5-14-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-26-81

Expiration of patents: The patents within the range of numbers indicated below expire during June 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,323,134 to 3,328,805, inclusive

Plant Patents ..... Numbers 2,766 to 2,749 inclusive

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public L ibrary	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6670
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
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Patents ..... Numbers 3,323,134 to 3,328,805, inclusive

Plant Patents ..... Numbers 2,766 to 2,749 inclusive

REEXAMINATIONS

JULY 3, 1984

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,502,645 (213th)
WATER-INSOLUBLE BENZOTHIAZOLE MONOAZO DYES

Duncan G. Carmichael, Gastonia, N.C., assignor to Martin Marietta Corporation

Reexamination Request No. 90/000,078, Sep. 30, 1981.
Reexamination Certificate for Patent No. 3,502,645, issued Mar. 24, 1970, Ser. No. 705,921, Feb. 16, 1968.
Filed Sep. 30, 1981, Ser. No. 705,921
Int. Cl.[3] C07D *277/82*; C09B *29/08*
U.S. Cl. 260—158

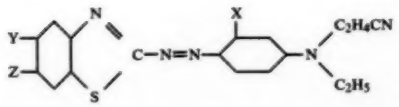
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1** and **3–5** is confirmed.

Claim **2**, having been finally determined to be unpatentable, is cancelled.

New claim **6** is added and determined to be patentable.

1. Water-insoluble azo dyes of the formula



wherein X is H or CH_3, Y and Z are Cl or Br, and wherein Y and Z are the same.

B1 4,071,987 (214th)
GRAVEL STOP

John B. Hickman, Asheville, N.C., assignor to W. P. Hickman Company, Inc., Asheville, N.C.

Reexamination Request No. 90/000,288, Nov. 10, 1982.
Reexamination Certificate for Patent No. 4,071,987, issued Feb. 7, 1978, Ser. No. 697,436, Jun. 18, 1976.
Filed Nov. 10, 1982, Ser. No. 697,436
Int. Cl.[3] E04D *13/05*
U.S. Cl. 52—94

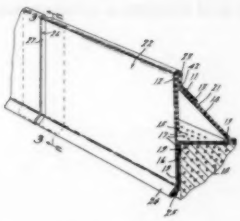
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **9** are determined to be patentable as amended:

Claims **2–8** and **10–12**, dependent on amended claims, are determined to be patentable.

New claims **13–15** are added and determined to be patentable.

1. In a spring unit forming a gravel stop at the edge of a roof, *said spring unit being* made of a sheet of spring material having vertical, horizontal and angular portions forming a spring unit with top and bottom edges, means for supporting the *spring* unit along the edge of a roof on the horizontal portion with the vertical portion extending downwardly therefrom, the top *edge* of the angular portion being moved downwardly when the angular portion is deflected, and *a generally* flat fascia



member[s] having channel elements along the top and bottom edges which face in opposite directions toward each other, the top and bottom edges of the spring unit [extend] *extending* within said channel elements when the angular portion of the spring unit is deflected downwardly and released to have the top and bottom edges thereof enter the facing channel elements at the top and bottom edges of [the] *said* fascia [members] *member* which [are] *is* supported thereby[.], *said top channel element of said fascia member being resiliently biased by said angular portion of spring unit in a generally inward direction relative to said vertical portion and a generally upward direction relative to said horizontal portion, and said bottom channel element of said fascia member being resiliently biased by said vertical portion of said spring unit in a generally inward direction relative to vertical portion and a generally downward direction relative to said horizontal portion when said fascia member is installed on said spring unit.*

DEFENSIVE PUBLICATIONS

PUBLISHED JULY 3, 1984

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T104,401

CARBOXYMETHYL HYDROXYETHYL CELLULOSE AS A THICKENER FOR DRILLING MUD

Thomas G. Majewicz, R.D. 1, Box 285, Chadds Ford, Pa. 19317

Filed Dec. 9, 1982, Ser. No. 448,136

Int. Cl.³ C09K *7/00*

U.S. Cl. 252—8.5 A

No Drawing. 6 Pages Specification

Carboxymethyl cellulose has not heretofore been universally useful as a thickener for drilling muds due to sensitivity of its aqueous solutions to the high level of inorganic salts contained in such muds. The inclusion in the carboxymethyl cellulose of hydroxyethyl functionality reduces this salt sensitivity to a level where it can be employed to thicken drilling muds, even those containing calcium salts. Carboxymethyl hydroxyethyl cellulose of carboxymethyl D.S. of 0.1 to 1.0 and hydroxyethyl M.S. of 0.5 to 2.5 are useful.

T104,402

THICKENING OF HEAVY BRINE SOLUTIONS

Thomas G. Majewicz, R.D. 1, Box 285, Chadds Ford, Pa. 19317

Filed Dec. 20, 1982, Ser. No. 451,522

Int. Cl.³ C09K *3/00*

U.S. Cl. 252—8.55 R

No Drawing. 7 Pages Specification

Thickening of heavy brine solutions based on calcium halides by use of carboxymethyl hydroxyethyl cellulose is disclosed wherein the carboxymethyl substitution level is about 0.05 to 0.35.

REISSUES

JULY 3, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,618

TUBULAR ORGANIC PROSTHESIS

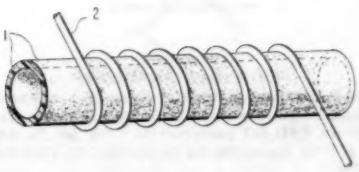
Hiroshi Mano, and Toshisaburo Oga, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Original No. 4,306,318, dated Dec. 22, 1981, Ser. No. 84,325, Oct. 12, 1979. Application for reissue Apr. 19, 1982, Ser. No. 369,962

Claims priority, application Japan, Oct. 12, 1978, 53-125953

Int. Cl.³ A61F *1/24*

U.S. Cl. 3—1.4 14 Claims



1. A tubular organic prosthesis comprising a porous tubing of polytetrafluoroethylene and elastic fibers provided helically on its outside surface.

Re. 31,619

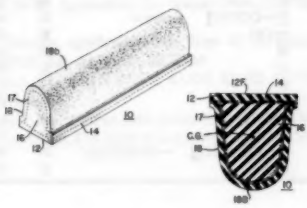
SWEEPER BRISTLE AND METHOD OF MAKING

John D. Holley, Montgomery, Ala., assignor to Holley Engineering Company, Inc., Montgomery, Ala.

Original No. 4,367,564, dated Jan. 11, 1983, Ser. No. 254,174, Apr. 14, 1981. Application for reissue Jun. 17, 1983, Ser. No. 505,282

Int. Cl.³ A46D *1/04;* A46B *7/10*

U.S. Cl. 15—179 33 Claims



20. An invention comprising a road bed cleaning solid reinforced elastomeric elongate bristle including:

elastomeric material having a cross-section with an external U-shaped sweeping curve and an external trailing straight line connecting tops of said U-shaped sweeping curve, said U-shaped sweeping curve being part of an external sweeping surface extending lengthwise on the bristle; and

a first piece of reinforcing stranded material disposed further from a cross-section center of gravity than from the nearest external surface of the bristle and a portion of said first piece of reinforcing stranded material following the contours of said external sweeping surface with elastomeric material between said portion of said first piece of reinforcing stranded material and said external sweeping surface.

Re. 31,620

COATED ABRASIVE PRODUCT CONTAINING FUSED ZIRCONIA GRAINS AND METHOD FOR ABRADING IRON

Sidney M. Leahy, Tokyo, Japan, assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Original No. 3,996,702, dated Dec. 14, 1976, Ser. No. 690,599, May 27, 1976.

Continuation of Ser. No. 527,432, Nov. 26, 1974, abandoned, which is a continuation of Ser. No. 99,716, Dec. 18, 1970, abandoned, which is a continuation-in-part of Ser. No. 722,172, Apr. 18, 1968, abandoned. Application for reissue Mar. 18, 1981, Ser. No. 245,081

Int. Cl.³ B24D *11/00;* C09K *3/14*

U.S. Cl. 51—328 6 Claims

1. Coated abrasive sheet material especially suited for formation into endless belts, said sheet material having a durable, flexible woven cloth backing and abrasive grains firmly adherently bonded thereto by a hardened phenol-formaldehyde resin, *said grains consisting essentially of a co-fused blend of alumina and zirconia,* at least 10% of the total weight of said grains consisting of fused zirconia, the balance of the total weight of said grains being no harder than fused alumina, whereby at high pressures an endless belt formed from said sheet material abrades, before failure, a significantly greater weight of free carbon-containing iron castings than does a belt of identical construction except for the use of abrasive grains free from [fused] *a co-fused blend of alumina and* zirconia.

Re. 31,621

LOCK-UP CLUTCH FOR A HYDRAULIC UNIT

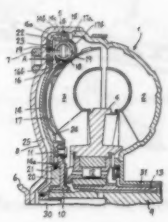
Shuzo Moroto, 39-8 Takane-cho, Kamezaki Handa Aichi Prefecture, and Kouji Kobayashi, 112-8 Nishiyama Nakane-cho, Toyoda Aichi Prefecture, both of Japan

Original No. 4,274,519, dated Jun. 23, 1981, Ser. No. 31,505, Apr. 19, 1979. Application for reissue Nov. 8, 1982, Ser. No. 439,937

Claims priority, application Japan, Apr. 28, 1978, 53-51162

Int. Cl.³ F16D *3/66, 13/70*

U.S. Cl. 192—3.28 11 Claims



10. A torque converter comprising;

a. a pump impeller connected mechanically with a power shaft of a prime mover;

b. a turbine runner which transmits a driving force given by said pump impeller through a fluid to said power shaft;

c. A stator which forces the circulating flow of the fluid to said pump impeller from said turbine runner;

d. A one-way clutch which restricts unilaterally the direction of rotation of said stator;

e. a lock up clutch comprising an annular piston having a flange area and notches on the external circumference of said flange area, said annular piston being movable in an axial direction, capable of engaging aid disengaging with a casing, said casing being connected with said pump impeller, said pump impeller

being installed between said casing and said turbine runner to transmit directly input from the power shaft of said prime mover to said turbine runner by mechanical means;

f. a circulation flow passage for said fluid, located near an inlet opening of said turbine runner;

g. a vibration damper installed outside of said circulation flow passage;

h. a friction material installed between said annular piston and said casing, said friction material engaging a power transmission surface;

i. a driving plate connected with said annular piston, said driving plate having notches on its external circumference, said notches crossing the axis of said torque converter at nearly right angles, said driving plate capable of being driven on the plane of said annular piston;

j. a driven plate rotatably connected to said driving plate, positioned between said turbine runner and said annular piston; and

k. means for supporting reciprocal motion of said annular piston and the relative rotary motion of said turbine runner and said casing, wherein said vibration damper engages with a plurality of openings on said driving plate, and is between the outside circumference of said driven plate which is fixed to said turbine runner at its inside circumference and the inside circumference of said driving plate, said driving plate having an outside diameter nearly equal to the entrance diameter of said turbine runner, and the outside circumference of said driving plate being splined with the outside circumference of said annular piston.

Re. 31,622

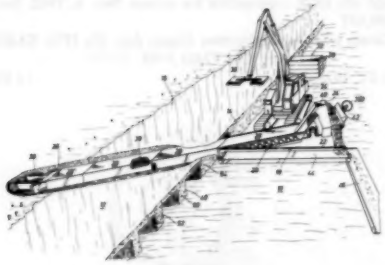
MINING MACHINE HAVING RECTANGULAR THRUST TRANSMITTING CONVEYOR COLUMN

Robert E. Todd, Houston, Tex., assignor to Rijn-Schelde-Verolme Machinefabrieken en Scheepswerven N.V., Rotterdam, Netherlands

Original No. 4,014,574, dated Mar. 29, 1977, Ser. No. 566,986, Apr. 10, 1975. Application for reissue Oct. 29, 1982, Ser. No. 437,685

Int. Cl.³ E21C *27/24, 29/02, 35/24*

U.S. Cl. 299—1 **41 Claims**



30. A mining machine for mining mineral formations comprising:

a cutting head including means for cutting a mineral formation, the dimensions of said cutting head from side-to-side being substantially greater than its vertical dimension,

a power head disposed remote from said cutting head,

a thrust transmitting column disposed intermediate said cutting head and said power head, said thrust transmitting column being nonrotatable about its longitudinal axis and comprising a plurality of reusable column modules removably connected in end-to-end engagement, a forwardmost one of said column modules being removably connected to said cutting head and a rearwardmost one of said column modules being removably connected to said power head, each of said column modules comprising a box-like structure having a substantially greater dimension from side-to-side than vertically and being effective to transmit thrust as a unitary member, said plurality of column modules collectively functioning as a single thrust transmitting column member,

a column conveyor section disposed within the box-like section of, and carried by, each said column modules,

first means releasably securing adjacent column modules in thrust transmitting engagement,

said column conveyor sections being non-thrust transmitting,

said power head being effective to selectively apply forward or rearward force to the rearwardmost column module of said thrust transmitting column to selectively urge said cutting head forwardly into said mineral seam to facilitate cutting said mineral seam, or rearwardly thereof to facilitate removal of said cutting head and column from said mineral formation.

Re. 31,623

PESTICIDAL CINNOLINES

John S. Badmin, and Richard F. Jones, both of Faversham, England, assignors to Shell Oil Company, Houston, Tex.

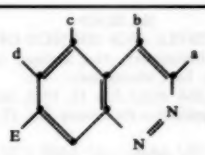
Original No. 4,125,613, dated Nov. 14, 1978, Ser. No. 867,419, Jan. 6, 1978. Application for reissue Mar. 25, 1983, Ser. No. 478,756

Claims priority, application United Kingdom, Jan. 10, 1977, 718/77

Int. Cl.³ A01N *43/48*

U.S. Cl. 424—250 **2 Claims**

1. A method for killing insect and acarid pests which comprises applying to a locus infested by said pests an effective amount of one of eleven cinnolines of the formula



(I)

wherein, respectively, a, b, c, d, and e are:

a	b		c	d	e
H	H		H	H	H
H	[—COOH]	*phenyl*	H	H	H
H	—OH		H	Br	H
Br	H		H	H	H
H	H		H	H	Cl
H	H		Cl	H	H
H	$-CH_3$		H	H	H
$-CH_3$	$-C_2H_5$		H	H	H
$-CH_3$	—OH		H	H	H
$-CH_3$	[$-COOCH_3$]	$-OC(O)CH_3$	H	H	H
$-CH_3$	H		H	H	H

Re. 31,624

METHOD OF TREATING INFLAMMATION

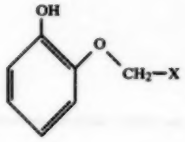
Floyd E. Dewhirst, Arlington, Mass., assignor to Forsyth Dental Infirmary for Children, Boston, Mass.

Original No. 4,244,956, dated Jan. 13, 1981, Ser. No. 97,506, Nov. 26, 1979. Application for reissue Dec. 22, 1982, Ser. No. 452,296

Int. Cl.³ A61K *31/44, 31/47, 31/41, 31/09*

U.S. Cl. 424—258 **13 Claims**

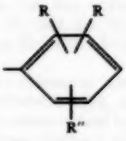
1. A method of treating inflammation in mammals, which method comprises administering to the mammal a therapeutical effective amount of a compound of the formula:



where X is selected from the group consisting of:

(a) naphthyl, pyridyl, quinolyl and 2-benzimidazolyl; and

(b) *phenyl radical or* a *mono or di* substituted phenyl having [the structural formula



where R, R' and R" are hydrogen,] *radical substituent groups selected from the group consisting of* halogen, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_1–C_6 alkoxy or combinations thereof and the nontoxic pharmaceutically acceptable salts thereof.

Re. 31,625

FUNGICIDAL AGENTS PROCESSES FOR THEIR PREPARATION AND THEIR USE FOR COMBATING FUNGI

Helmut Kaspers, Leverkusen, and Wilhelm Brandes, Leichlingen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

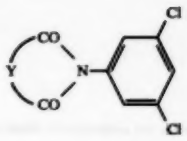
Original No. 4,296,116, dated Oct. 20, 1981, Ser. No. 88,688, Oct. 26, 1979. Application for reissue Nov. 3, 1982, Ser. No. 438,827

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1978, 2849695; Jul. 31, 1979, 2931034

Int. Cl.³ A01N *43/76, 41/06, 43/80, 43/50*

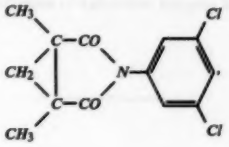
U.S. Cl. 424—272 **11 Claims**

1. A fungicidal composition comprising a fungicidally effective amount of (1) [at least one carboximide of the formula

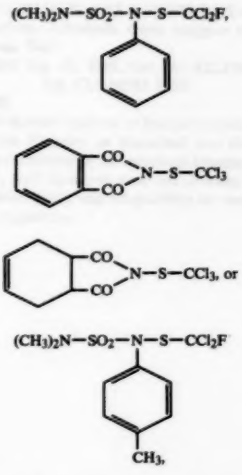


in which

Y represents a bifunctional group linking the two carbonyl groups with formation of an optionally substituted 5-membered heterocyclic ring with a total of 1 or 2 hetero-atoms (O and N),]



and (2),



the weight ratio of component (1) to component (2) ranging from about 1:1 to 1:4.

PLANT PATENTS

GRANTED JULY 3, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,252
AFRICAN VIOLET PLANT NAMED IMPROVED EVELYN

Reinhold Holtkamp, Isselburg, Fed. Rep. of Germany, assignor to Gessellschaftsvertrag uber die Erfindergemeinschaft "Optimara", Rees Haffen, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,360
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Improved Evelyn, as described and illustrated, and particularly characterized by its vigorous growth habit; upright flower stems which are generally centrally positioned; large deep violet blue single flowers; floriferous flowering habit, with 7–10 flowers being produced per stem, and by its medium green leaves which provide a good contrast to the deep violet color.

5,253
KALANCHOE PLANT NAMED ETERNITY

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Sep. 23, 1982, Ser. No. 422,523
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of kalanchoe known by the cultivar name Eternity, as described and illustrated, and particularly characterized by its salmon red flower color; massive inflorescence without deterioration of the initial flowering of the terminal florets, and its excellent compact self branching growth with dark green crenate foliage, thereby increasing the potential of production of kalanchoe hanging baskets.

5,254
KALANCHOE PLANT NAMED ROYALTY

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Sep. 23, 1982, Ser. No. 422,150
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of kalanchoe plant, known by the cultivar name Royalty, as described and illustrated, and particularly characterized by its excellent keeping quality, free branching habit, well clustered, rose-red flowers, highly floriferous and vigorous habit, and adaptability to various pot sizes and to growth regulators.

PATENTS

GRANTED JUL. 3, 1984

ERRATA

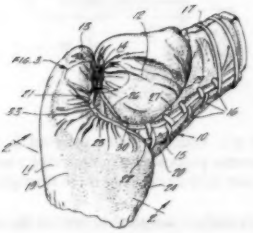
For CLASS	See PATENT NO.
446–327	4,447,097
446–435	4,457,098
446–437	4,457,099
446–333	4,457,100
446–456	4,457,101
122–004	4,457,289
182–164	4,457,391
296–001	4,457,558
411–094	4,457,730
585–011	4,457,828
524–014	4,457,978
210–266	4,458,059
381–032	4,458,110
324–057	4,458,196
324–073	4,458,197
324–133	4,458,198
333–248	4,458,229
382–001	4,458,235

PATENTS

GRANTED JULY 3, 1984

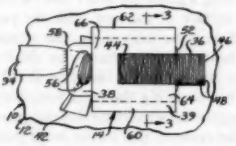
GENERAL AND MECHANICAL

4,457,023
BOXING GLOVE WITH THUMB TIE DOWN
Arthur M. Easterday, Sidney, Nebr., assignor to Safe Play Manufacturing Co., Inc., Sidney, Nebr.
Filed Jun. 29, 1982, Ser. No. 393,465
Int. Cl.³ A41D *13/10*
U.S. Cl. 2—18 **1 Claim**



1. A boxing glove having a glove body confining the fingers, said body having a thumb guard adjacent the area of the index finger a thumb sheath, confining the thumb, formed integrally at its base with the glove body and having a tip portion, a connecting bridge connecting the thumb sheath adjacent the tip portion to the thumb guard of the glove body for limiting movement of the thumb sheath relative to the glove body and thereby maintaining the thumb sheath in a tightly closed position, said connecting bridge comprising a woven flexible webbing of generally rectangular configuration and of a width of approximately ¼ inch.

4,457,024
DISPOSABLE GARMENT WITH CARD TUNNEL
Cynthia A. Wichman, St. Charles, Ill., assignor to The Kendall Company, Boston, Mass.
Filed Apr. 22, 1982, Ser. No. 370,881
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—51 **9 Claims**



1. A disposable garment, comprising:

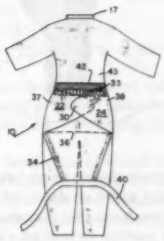
a gown having a pair of sleeves, a front, a pair of side margins defining an open back for the gown, and a tunnel having a pair of opposed closed sides, and a pair of opposed ends being open;

a first belt having one end secured to the gown and the other end being free;

a second belt having one end secured to the gown; and

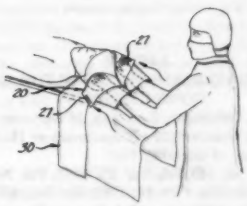
a transfer card having one end received in the tunnel through one of said open ends, and means for releasably attaching the other end of the first belt adjacent the other end of the card.

4,457,025
DROP-SEAT JUMP SUIT
Harriette E. Meryash, 35 Curtis St., Marblehead, Mass. 01945
Filed Oct. 18, 1983, Ser. No. 543,153
Int. Cl.³ A41D *1/06*
U.S. Cl. 2—79 **13 Claims**



1. A jumpsuit having a body, a pair of arm sleeves, a pair of leg sleeves, and a rear drop seat panel that pivots from the suit body, said suit having a pair of spaced flaps attached to the body of said suit proximate the waist thereof, which flaps overlap around the rear portion of said suit near the waist and inside said drop seat panel when raised to the closed position.

4,457,026
SURGICAL HEAD DRAPE
Henrietta K. Morris, Arlington, Tex., assignor to Surgikos, Inc., Arlington, Tex.
Filed Sep. 30, 1983, Ser. No. 538,061
Int. Cl.³ A42B *00/00*
U.S. Cl. 2—171 **4 Claims**



1. A surgical drape comprising a main sheet having an upper surface and a lower surface, a top edge, a bottom edge and two side edges, a cuff at the top edge of the main sheet being secured to the body of the main sheet by lines of attachment, a head sheet secured to the upper surface of the main sheet adjacent to the top edge of the main sheet, said head sheet having a top edge, a bottom edge and two opposing side edges, a cuff at the top edge of said head sheet, the side edges of the head sheet being overlapped and secured to each other along the bottom edge of the head sheet, the side edges of said head sheet being folded from a point near the bottom edge of said head sheet at an angle of from about 30° to 60° to form an opening, a line of adhesive along the top edge of at least one portion of said head sheet to provide closure means to attach the head sheet around the head of a patient.

4,457,027

HEAD GARMENT FOR PROTECTION OF CLOTHING

Maryl E. Gladstone, 1230 N. Walnut St., La Habra, Calif. 90631

Filed Jul. 1, 1983, Ser. No. 510,280
Int. Cl.³ A42B 1/18
U.S. Cl. 2—174 6 Claims

1. A device to protect clothes being put on or removed from a user from becoming soiled or damaged comprising:

a generally bulbous, hood-like garment, having a base portion and upper portion formed of a thin mesh-like fabric and adapted to be worn about the head of a user;

a first aperture formed in the base portion of the garment sized to allow placement of said garment over the head of a user;

resilient means positioned adjacent said aperture for allowing said aperture to be initially expanded to a size sufficient to extend over the head of a user and subsequently contracted to a size sufficient to gather the base portion of the garment about the neck of the user, said garment when positioned about the head of a user forming a barrier preventing direct contact of the user's face with clothes being put on or removed from the user;

an expansion area in said base portion adapted to receive the chin of the user and register said garment upon the user's head; and

a second aperture formed in said upper portion of said garment, said second aperture sized to have a circumference less than the circumference of the user's head to locate said garment upon the user's head.

4,457,028

SURGICAL MATERIALS SUITABLE FOR USE WITH BONE CEMENTS

Klaus Draenert, Ottobrunn, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 143,570, Apr. 25, 1980, Pat. No. 4,365,357.
This application Oct. 14, 1982, Ser. No. 434,306
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1980, 2917446
The portion of the term of this patent subsequent to Dec. 28, 1999, has been disclaimed.
Int. Cl.³ A61F 1/04
U.S. Cl. 3—1.91 14 Claims

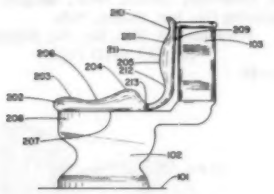
10. A bone cement preparation kit for bone repair or other treatment of a bone defect, consisting essentially of a surgical network material which is of multi layers, at least one layer being formed of physiologically acceptable filaments which are resorbable and are of a thickness of about 50–about 300 μm and at least one layer being formed of filaments which are non-resorbable and are of a thickness of about 100–about 750 μm, the network having an internal mesh width of about 1–10 mm and having a shape appropriate to the intended use, and a prepolymer and monomer for preparation of bone cement useful in bone repair or other bone treatment.

4,457,029

TOILET SEAT STRUCTURE

Herbert Matthews, 33 N. Evergreen Dr., Selden, N.Y. 11784

Filed May 14, 1981, Ser. No. 263,402
Int. Cl.³ A47K 13/00
U.S. Cl. 4—237 3 Claims



1. A toilet seat structure being oriented in the horizontal plane for reference purposes and comprising a one piece generally annular seat with an opening there through, the seat having:

(a) a bottom surface designed to rest on the toilet bowl for support,

(b) a top surface to support the body having:

(i) a forward segment containing a first raised area, the area of highest elevation within said first raised area being located generally centrally between the inner and outer periphery of the seat,

(ii) a rear segment containing a second raised area, the area of highest elevation with said second raised area being elevated substantially above said first raised area of the forward segment and located generally centrally between the inner and outer periphery of the seat,

(iii) an intermediate segment bridging the forward and rear segments, the central portion of the intermediate segment between the forward and rear segment being generally horizontal and the edge of the intermediate segment in its central portion adjacent the opening forming a generally vertical wall joining the upper and lower surface of the seat, wherein the intermediate segment extends downward in its central portion to a generally horizontal area which is at an elevation below that of the forward horizontal segment and further comprises a first inclined portion which connects the forward segment to the intermediate segment and a second inclined portion which connects the rear segment to the intermediate segment, said seat structure comprising a generally heart shaped contour line on the upper surface of the seat with the peaks of the heart located symmetrically on the rear segment and the point of the heart located centrally on the front segment, the contour line generally bisecting the forward rear segments but touching the inner periphery formed by the opening, the upper surface sloping generally downward from the contour line to the inner periphery, said seat structure further including a first centrally located concave portion on the upper surface on the forward segment and a second centrally located concave portion in the rear segment, the first and second concave portions divide the generally horizontal areas in the forward and rear segments into two sets of flattened peaks for each segment, said seat structure further comprising a lid having:

(a) an upper generally planar surface,

(b) a lower surface complementarily configured to the upper surface of the seat to abut the forward, rear and intermediate segments thereof, and

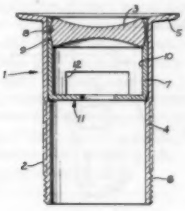
(c) means mounting the lid for movement from a position overlying the seat to another position.

4,457,030

WASTE OUTLET FITTINGS

Russell D. Burry, 1 Sulby Rd., Thorpland's Brook Northampton, England

Filed May 17, 1983, Ser. No. 495,174
Claims priority, application United Kingdom, May 18, 1982, 8214358
Int. Cl.³ A47K 1/14
U.S. Cl. 4—286 6 Claims



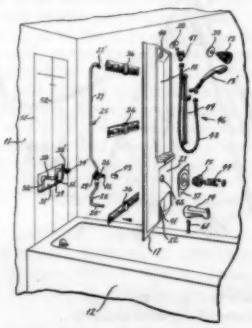
1. A waste outlet fitting comprising: a tubular body which, in use, is sealingly mounted in a waste outlet opening; a longitudinally extending waste flow passage defined within the tubular body; a seat defined within the tubular body; a seat defined within the tubular body surrounding the flow passage; and a circular disc-like plug mounted in the body for manipulation by hand between a closed position in which the periphery of the plug sealingly engages the seat and the plug extends across the flow passage to close the flow passage to fluid flow, and an open position in which portions of the periphery of the plug are spaced from the seat to permit fluid flow through the flow passage, wherein the plug periphery and seat are of mating part-spherical shape, the plug being held in the tubular body solely by interaction of the part-spherical periphery of the plug with the mating part-spherical seat whereby the plug can be rotated about any horizontal axis passing through the centroid of the part-sphere by finger pressure on the plug to move the plug between its closed and open positions.

4,457,031

MODULAR PRE-PLUMBED SHOWER UNIT

John W. Moore, Creve Coeur, Mo., assignor to The Swan Corporation, St. Louis, Mo.

Filed Apr. 28, 1982, Ser. No. 372,841
Int. Cl.³ A47K 3/04
U.S. Cl. 4—614 3 Claims



1. A modular shower unit of pre-plumbed, preconnected character for wall securement for permitting ready interconnection of the shower unit with pre-existing plumbing internal of the wall and to which access may be secured through the wall, said shower unit providing for the connection of said pre-existing plumbing to both a shower head fixture and a tub spout of said modular shower unit, said modular shower unit comprising:

a single, one-piece integral shell enclosure defining within it a concealed vertically elongated cavity lying adjacent the wall, the cavity extending the length between the shower head fixture and tub spout, the shell enclosure including a closed periphery for bearing against the wall at all points completely around the full extent of the periphery for closing and concealing the cavity by adjacency to the wall, and for concealing within the cavity a plumbing assembly providing said plumbing interconnection externally of said wall;

the plumbing assembly including:

(a) a control valve having a control knob securement means;

(b) means for securing the control valve to the enclosure within the cavity in spaced relationship to the wall and with the control knob emerging from the front of the enclosure;

(c) the shower head fixture, which shower head fixture emerges from the enclosure at its upper end;

(d) a first conduit extending upward within the recess from the valve and interconnecting the shower head fixture and the valve;

(e) the tub spout, which tub spout emerges from the enclosure at its lower end;

(f) a second conduit extending downward within the recess from the valve and interconnecting the tub spout and the valve; and

(g) means at opposite sides of the valve for direct connection of the valve to the pre-existing plumbing within the wall through access made through the wall rearwardly of, and concealed by, the enclosure, such connection being within and fully concealed by the cavity;

the entirety of the plumbing assembly being contained within the cavity,

securement means associated with the enclosure and operatively interconnected with elements of the modular shower unit for mounting of the enclosure upon the wall and for pressing the enclosure against the wall; and

a resilient seal extending fully around the periphery of the shell and interposed between the periphery and the wall for providing a wall-conforming water-resilient sealing relationship between the enclosure and the wall;

the enclosure defining within its front, outer surface a vertically-elongated recess extending below the shower fixture but terminating above the control valve in a ledge serving as a soap dish, the recess having forwardly extending side edges for obscuring shower items such as placed within the recess and having also a rear surface spaced outwardly from the wall.

4,457,032

SEAT CUSHION

Edwin B. Clarke, 41 Conshohocken St. Rd., Bala Cynwyd, Pa. 19004

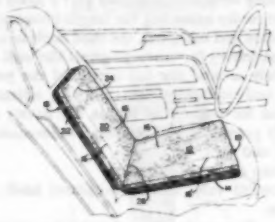
Filed May 21, 1981, Ser. No. 266,090
Int. Cl.³ A47C 27/15; B60N 1/02
U.S. Cl. 5—481 14 Claims

1. In a portable auxiliary seat cushion having a seat panel and a back rest panel hingedly connected by a hinge connection to form a unitary structure and wherein the under side of said seat panel and the rearward side of said back rest panel have a high coefficient of friction to prevent relative slippage between said seat cushion and any supporting surfaces on which it is placed; the improvement which comprises, in combination;

said under side of said seat panel and said rearward side of said back panel being composed of a flexible, resilient synthetic plastic foam having a high coefficient of friction; and

stitch means for preventing said back panel from falling forward onto said seat panel, said stitch means extending across said hinge connection and being anchored in said

seat panel and back rest panel, thereby maintaining said back panel in a generally upright position when said seat



cushion is placed on a structure providing support for said seat panel and back rest panel.

4,457,033

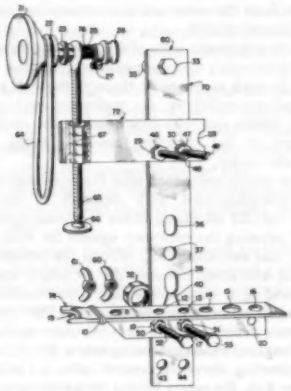
ADJUSTABLE COMBINATION LAWN MOWER TOOL

Theodore P. Lightner, Box 712, Smithville, Tex. 78957

Filed Oct. 21, 1982, Ser. No. 435,561

Int. Cl.³ B25B *13/48*; B25F *3/00*; B23P *19/04*

U.S. Cl. 7—138 **10 Claims**



1. An adjustable combination tool comprising:

an elongated first bar;

a projection extending from one side thereof;

a second bar coupled to said first bar perpendicular thereto and at a predetermined position from said projection;

said projection, in cooperation with said second bar, providing a wrench-like coupling with a starter clutch housing on a small gasoline combustion engine when placed on top thereof for removing or tightening the same;

an angle iron;

means for coupling said first bar and said angle iron in a first position in which said angle iron is perpendicular to said first bar and a second position in which said angle iron is parallel to and extending from said first bar;

a threaded bolt having an enlarged end; and

means for threadedly coupling said threaded bolt to said second bar,

said first bar, second bar and angle iron forming a C-shaped clamping device when said angle iron is in said first position in which said enlarged end of said bolt and a part of said angle iron form opposed clamping surfaces,

said angle iron forming an extension of said first bar for use as a wrench handle extension when said angle iron is in said second position.

4,457,034

IMPROVEMENTS RELATING TO THE MOISTENING AND SUBSEQUENT TEXTURING OF TEXTILE YARNS

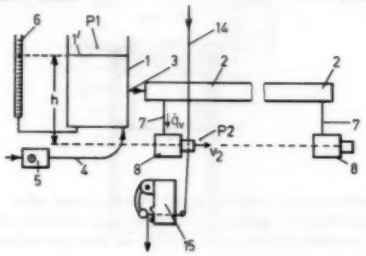
Christian Simmen, Lichtensteig, Switzerland, assignor to Heberlein Maschinenfabrik AG, Wattwil, Switzerland

Filed Jun. 29, 1981, Ser. No. 278,468

Claims priority, application Switzerland, Jul. 9, 1980, 5238/80

Int. Cl.³ D06B *1/08*

U.S. Cl. 8—151.2 **2 Claims**



1. A process for moistening a plurality of textile yarns prior to texturing of the yarn by means of pressurized gas from a jet, comprising charging a plurality of moistening devices from a liquid tank, the moistening devices each comprising a die defining a longitudinal bore therein, and an outlet aperture in the front face of the die past which the yarn is led, and regulating the quantity of fluid fed to the tank by means of a flow regulator which is adjusted to provide a predetermined quantity of fluid corresponding to a throughput of fluid through the bore of each die which is matched to the titre and the speed of passage of the yarns.

4,457,035

SUSPENSION BRIDGE AND METHOD OF ERECTING SAME

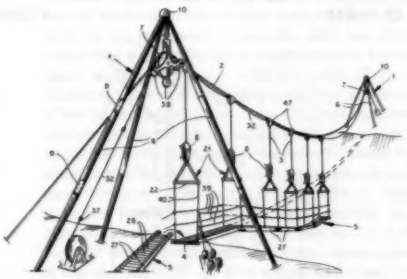
Willy Habegger, Hünibach, and Ernst Lauber, Thun, both of Switzerland, assignors to Willy Habegger AG, Thun, Switzerland

Filed Apr. 7, 1982, Ser. No. 366,356

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114532

Int. Cl.³ E01D *11/00*

U.S. Cl. 14—18 **14 Claims**



1. A suspension bridge comprising:

a pair of horizontally spaced towers;

a main catenary cable suspended from and extending between said towers;

a flexible spacer element extending along said main cable between said towers and provided with generally equispaced spacers;

respective hanger assemblies fixed at said spacers and slidable on said main cable between said towers;

respective upright hangers defining a vertical plane with said main cable and having upper ends connected to the respective hanger assemblies and lower ends;

respective means between said ends for shortening and lengthening the distance therebetween;

respective girders secured to said lower ends and extending generally perpendicular to said plane; and

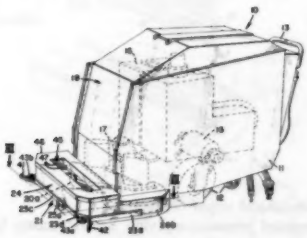
respective path sections extending generally horizontally and each having one end hooked over a respective one of said girders and another end hooked over an adjacent girder, said sections each having an effective length between the respective girders equal generally to the distance between adjacent spacers of said spacer element, said sections together forming a continuous path between said towers, said path section having ends formed with downwardly open recesses receiving the respective girders and linking each path section at each of its ends to the respective girder for pivoting relative thereto generally about the axis of the respective girder, said bridge further comprising means for securing the path-section ends down on the respective girders.

4,457,036

DEBRIS COLLECTING MECHANISM

Alfred D. Carlson, Robbinsdale; Donald J. Hauh, Champlin, and Mark E. Snetting, Minneapolis, all of Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Sep. 10, 1982, Ser. No. 416,655
Int. Cl.³ A47L *11/16*
U.S. Cl. 15—49 R **32 Claims**



1. A maintenance machine used to simultaneously sweep and scrub floor surfaces, comprising movable body means including a forward end, at least two substantially side-by-side disc brushes carried by said body means, said brushes including a forwardmost brush positioned slightly ahead of a rearwardmost brush, said brushes rotating in the same rotational direction as determined by the forward edge of the forwardmost brush with said rearwardmost brush sweeping generally towards the forwardmost brush; a housing attached to said forward end, said housing comprising a rearwardly opening hopper for containing debris swept therein by said brushes; and means for receiving debris, said receiving means being mounted intermediate said hopper and said brushes adjacent said rearward opening for receiving debris swept forwardly by said brushes.

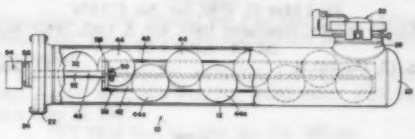
4,457,037

SPHERE LAUNCHING APPARATUS

Nicholas M. Rylander, 4501 E. 45th St., Tulsa, Okla. 74135

Filed Sep. 23, 1982, Ser. No. 422,364
Int. Cl.³ B08B *9/04*
U.S. Cl. 15—104.06 A **10 Claims**

1. A sphere launching apparatus comprising a non-vertical storage barrel for storing a plurality of sequentially arranged spheres therein, access port means provided on the barrel for loading of the spheres therein, discharge port means provided on the barrel for discharging the spheres therefrom, parallel track means provided in the barrel and extending longitudinally therein for supporting parallel rows of the spheres in mutually offset relation, and selector release means mounted in



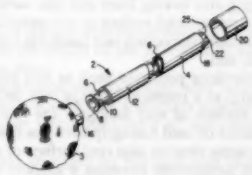
the interior of barrel for selective engagement with the leading sphere of each row whereby a single sphere at a time may be released for discharge through the discharge port means.

4,457,038

HANDLE FOR DISPOSABLE BRUSH OR MOP HEAD

Dennis A. Hammond, Ottawa, Canada, assignor to Dustbane Products Limited/Les Produits Dustbane Limitee, Ontario, Canada

Filed Nov. 16, 1982, Ser. No. 442,121
Int. Cl.³ A46B *17/02*
U.S. Cl. 15—145 **9 Claims**



1. A handle for a disposable brush or mop head comprising:

(a) an elongated hollow handle body having bottom and top ends, the bottom end to releasably frictionally engage a disposable brush or mop head and secure it in working position on the handle body;

(b) an elongated plunger having bottom and top ends and being longitudinally movable between an operative position wherein the plunger is to bear against a portion of the brush or mop head when secured in working position to dislodge it from engagement with the elongated hollow body, and an inoperative position in which the plunger is not to bear against a portion of the brush or mop head when the latter is secured in working position on the handle body;

the hollow body and plunger being of cylindrical construction, the outer diameter of the plunger being slightly less than the inner diameter of the outer body to provide a flush but slidably movable fit of the plunger with respect to the cylindrical body, the bottom end of the plunger being slightly outwardly flared and, in said operative position, extending beyond the bottom end of the elongated body, the flare of the bottom end of the plunger preventing the bottom end of the plunger from being drawn past the body's bottom end; and

(c) plunger actuation means secured to the plunger and operatively exposed for manipulation by the operator, to cause movement of the plunger between said operative and inoperative positions.

4,457,039

TOOTHBRUSH WITH ANATOMICALLY DESIGNED HANDLE

Berardo Massari, Via Gramsci 76, Rozzano (Milano), Italy

Filed May 17, 1982, Ser. No. 379,578
Claims priority, application Italy, Apr. 5, 1982, 21455/82[U]
Int. Cl.³ A46B 9/04
U.S. Cl. 15—167 R 11 Claims

1. A toothbrush, comprising:

a bristle-carrying head;

a plurality of bristles arranged on said bristle-carrying head and having a base and an external surface;

a handle having a straight handgrip which is parallel to said external surface of said bristle-carrying head and has two spaced ends and disposed rearwardly of said external surface, said handgrip also having front and rear surfaces as considered relative to said external surface of said bristles, said handle also having a section connecting said handgrip with said bristle-carrying head; and

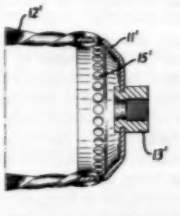
two projections provided each at said rear surface of said handgrip at a respective one of said ends, so that on said front surface of said handgrip the thumb of the user is supported on said handgrip between said projections, and at the same time on said rear surface of said handgrip one of said projections provides a support for the forefinger whereas the other of said projections provides a support for the little finger of the user so as to counteract by the forefinger and the little finger the force applied by the thumb.

4,457,040

INDUSTRIAL WIRE CUP-SHAPED BRUSH

Frank J. Hettes, Greentown, Pa., assignor to Weiler Brush Company, Cresco, Pa.

Continuation-in-part of Ser. No. 294,500, Aug. 20, 1981, abandoned. This application Jan. 10, 1983, Ser. No. 456,963
Int. Cl.³ A46B 13/02
U.S. Cl. 15—180 3 Claims



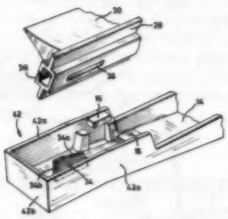
1. An industrial wire cup-shaped brush comprising a knot plate having a central portion and an outer cup-shaped peripheral portion, a plurality of knot holes uniformly spaced apart in the peripheral portion of the knot plate, the distance between the outer peripheries of the holes in the knot plate and the outer periphery of the knot plate being at least double the thickness of the knot plate to form a plurality of elongated bristle supports, and a plurality of wire bristles looped through the knot holes and twisted beyond the outer periphery of the knot plate and extending beyond the outer periphery of the knot plate to form a circular array of bristles, the portions of the bristles within the knot holes being sharply bent so that the inner and outer portions of the bristles intermediate the knot hole and the outer periphery of the knot plate lie closely to the respective surfaces of the knot plate, the bristles being twisted tightly beyond the outer periphery of the knot plate to form elongated loops of generally complementary shape to the elongated supports on the knot plate, thereby holding the bristles in proper position and resisting pivotal movement of the bristles relative to the knot plate when the brush is subjected to high centrifugal forces at high speeds of rotation and when the brush is used in scrubbing applications.

4,457,041

RETAINING SYSTEMS FOR SQUEEGEE ASSEMBLIES IN WINDSHIELD

Edward G. Kimber, Carlisle, and Peter C. Norris, Oakville, both of Canada, assignors to Tridon Limited, Hamilton, Canada

Filed Aug. 13, 1982, Ser. No. 407,854
Int. Cl.³ B60S 1/02
U.S. Cl. 15—250.42 3 Claims



1. A windshield wiper comprising:

an elongated pressure-applying superstructure for connection to a wiper arm,

an elongated squeegee assembly releasably mounted on the said superstructure, and

retaining means for releasably retaining the squeegee assembly mounted on the superstructure,

the superstructure having thereon a plurality of longitudinally-spaced opposed pairs of claws embracing cooperating side edges of the squeegee assembly to mount the squeegee assembly on the superstructure,

the squeegee assembly comprising a backing member, the side edges of which are embraced by the said opposed pairs of claws to mount the squeegee assembly on the superstructure, and a squeegee mounted on the backing member,

the squeegee assembly being mounted in the superstructure claws, and dismounted therefrom, by longitudinal movement of the squeegee assembly respectively in and out of the said claws,

said retaining means comprising a projection from the undersurface of the superstructure at one end thereof adjacent to an endmost opposed pair of the claws and a cooperating registering recess in the upper surface of the backing member in which the projection engages to retain the squeegee assembly against said longitudinal movement, the distance between the recess and the said endmost claws being sufficient to permit flexing of the backing member by an operator for disengagement of the projection from the recess,

the superstructure having at the said one end a downwardly-extending shroud portion surrounding the said projection

and the adjacent backing member side edges and respective end edge,

the windshield wiper also comprising a thin flexible enclosure member enclosing the superstructure and the backing member against entry therein of snow and ice, the respective end of the flexible enclosure member surrounding the said shroud portion of the superstructure, the end wall of the shroud portion constituting an end closure for the respective end of the flexible enclosure member, and

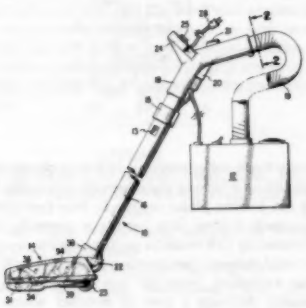
removable end closure means for the other end of the flexible enclosure member, the removable closure means being surrounded by the said other end of the flexible enclosure member, embracing the respective end of the backing member, having therein a pair of opposed claws for engagement with the respective other end of the backing member and having retaining means comprising a retaining projection in the under face thereof engaging in a recess in the upper face of the backing member at the respective other end thereof to retain the removable end closure member on the backing member.

4,457,042

CARPET CLEANING POWER HEAD DEVICE

John E. Jones, Greenville, and William K. Glenn, III, Anderson, both of S.C., assignors to The Singer Company, Stamford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,364
Int. Cl.³ A47L *11/00*
U.S. Cl. 15—322 **9 Claims**



5. For use with an external source of vacuum, a power head unit for a carpet cleaner and vacuum, said power head unit comprising:

a housing;

a brush supported by said housing for contact with the carpet;

means for rotating said brush;

means including an upwardly extending wand for connecting said housing to said external source of vacuum;

means in said housing for defining a brush chamber for receiving said brush, a vacuum chamber for communication on one end with said brush chamber and on the other end with said connecting means, and a powder retaining chamber for retaining a quantity of a dry chemical carpet cleaning material therein;

said housing further supporting means for selectively dispensing said dry chemical cleaning material onto said carpet; and,

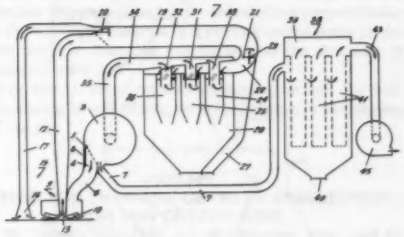
means supported by said wand for selecting between a vacuum mode of operation and a carpet cleaning mode of operation in which said dispensing means is selectively effective.

4,457,043

SWEEPER PARTICULARLY FOR COLLECTING DUST-LIKE MATERIAL, AND THE UTILIZATION THEREOF

Lennart Oeberg, Oxie, Sweden, and Alex Meyerhans, Uitikon, Switzerland, assignors to Aktiengesellschaft Rolba, Zurich, Switzerland

PCT No. PCT/CH80/00137, § 371 Date Jul. 13, 1981, § 102(e) Date Jul. 13, 1981, PCT Pub. No. WO81/01362, PCT Pub. Date May 28, 1981
PCT Filed Nov. 13, 1980, Ser. No. 285,185
Claims priority, application Switzerland, Nov. 16, 1979, 10243/79
Int. Cl.³ A47L *5/14*
U.S. Cl. 15—340 **8 Claims**



1. A sweeper particularly for collecting dust-like material, characterized by a moveable frame on which the following parts are mounted:

a main mouthpiece with at least one nozzle blowing from the outside against the center of the mouthpiece, and an inside suction pipe;

a secondary nozzle arranged moveably with respect to the main mouthpiece and having a separate suction pipe;

a common conduit into which both of said suction pipes open;

a coarse separator arranged on the inlet side of a multiple cyclone separator;

a cyclone exhaust conduit connected to center suction pipes in the multiple cyclone separator for conveying exhaust air to the suction side of a blower;

a separating piece arranged on the exhaust side of the blower for dividing the exhaust air in order to feed a portion thereof to the blowing nozzle in the main mouthpiece and the other portion of the exhaust to a second separator; and

an evacuation fan arranged at the outlet side of the second separator.

4,457,044

MULTIPLE FLIGHT ELEVATOR SYSTEM

Garard C. Erdman, Pomona; John L. Cottam, Rancho Cucamonga; Leonard S. Cox, Beaumont, and Richard B. Rosseau, Clairmont, all of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Sep. 30, 1982, Ser. No. 431,948
Int. Cl.³ E01H *1/04*
U.S. Cl. 15—348 **11 Claims**

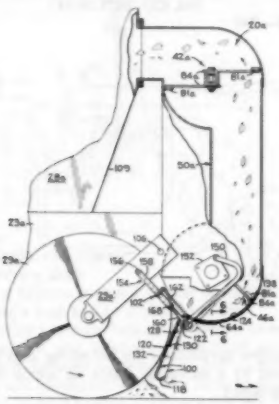
1. In a power driven mobile sweeper having a chassis which supports a hopper with an inlet opening near the upper end thereof, and a power driven pick-up broom supported by said chassis for movement between a raised position and an operative sweeping position engaging the surface to be cleaned, the improvement which comprises:

means defining an elevator housing supported by said chassis having a debris inlet opening adjacent said broom and a debris discharge opening communicating with said hopper inlet opening, said housing including arcuate end portions communicating with said inlet and discharge openings and

having an upright planer debris guiding surface disposed therebetween;

means defining a driven mechanical elevator in said elevator housing for receiving debris from said pick-up broom and for elevating at least the heavy pieces and large volumes of debris into the hopper;

said elevator including a plurality of driven paddle wheels with the lower paddle wheel propelling some debris along a path adjacent said planar guiding surface directly into the hopper and will progressively elevate other debris to the next higher paddle wheel with the uppermost paddle wheel discharging the debris into the hopper, each said



paddle wheel including transversely extending shaft means journaled in said elevator housing and connected to a pair of transversely extending long and narrow debris propelling portions that are connected to said shaft means by a plurality of resilient arms for providing large debris passages between said shaft means and said propelling portions; and

a driven blower for creating a low velocity easily controlled updraft of air through the elevator housing for elevating light debris into the hopper resulting in a more effective removal of dust and light debris from the surface being swept and minimizing the power required by the blower.

4,457,045

CASTOR HAVING INWARDLY CAMBERED WHEELS AND A RETAINER PLATE

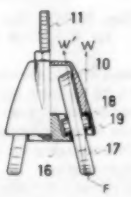
Jack P. Kegg, Unit 12, 104 St. George Crescent, Drummoyne, New South Wales 2047, Australia

Filed Sep. 7, 1982, Ser. No. 415,312

Claims priority, application Australia, Sep. 17, 1981, PF0796

Int. Cl.³ B60B *33/00*

U.S. Cl. 16—18 A **7 Claims**



1. A castor which comprises a pair of wheels rotatably supported by a support member, the wheels being rotatable about respective rotational axes, the support member being swivellable about an upstanding swivel axis;

each wheel having an inward angle of camber relative to a plane containing the swivel axis such that uppermost portions of the wheels are closer together than lowermost portions, said angles of camber of the wheels relative to the plane of the swivel axis being equal;

the support member comprising a casing defining a hollow cavity for receiving part of each said wheel, the hollow cavity having two opposed sides, each said wheel having first and second trunions on opposed sides thereof, a recess for rotatably receiving a respective first said trunnion being provided on each of said opposed sides of the cavity; and

a retainer plate attached to the casing and passing between the wheels, the plate having a recess on each opposed side thereof for rotatably receiving a respective second said trunnion.

4,457,046

TRACK ROLLER CARRIAGE ASSEMBLY FOR SUPPORTING A SLIDING DOOR, PANEL OR THE LIKE

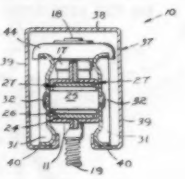
Lance M. Vater, 9 Redounau Crescent, Wattle Park, Australia 5066

Filed Jan. 7, 1982, Ser. No. 337,902

Claims priority, application Australia, Aug. 4, 1981, PF0040

Int. Cl.³ E05D *13/02*

U.S. Cl. 16—95 R **7 Claims**



1. A door track roller carriage assembly comprising a pair of joining plates, said joining plates having outer side faces, means retaining the joining plates in face to face contiguity as a sub-assembly, each joining face having a centrally located outwardly extending deformation portion which co-operates with the other said deformation portion to form a bolt aperture,

surfaces extending from the top of the joining plate sub-assembly defining a pair of notches which extend upwardly from receiving shoulders at the mouth of said bolt aperture, and a suspension bolt extending downwardly through said bolt aperture, the bolt having a head itself having surfaces defining slots extending radially inwardly from diametrically opposite sides and engaging the outer side faces of the joining plates when the bolt head is engaged by surfaces defining said sub-assembly notches,

a pair of transversely extending parallel bearings carried by said sub-assembly, axles extending through and journalled for rotation in respective said bearings, and track engaging roller wheels carried by said axles.

4,457,047

OVER-CENTER SELF-CLOSING HINGE HAVING A SPRING BIASED CAM THRUSTER

Karl Lautenschläger, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschläger K.G., Möbelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 416,004

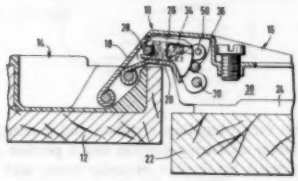
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1981, 3137552

Int. Cl.³ E05F *1/08*

U.S. Cl. 16—288 **7 Claims**

1. An over-center hinge for cabinet doors, comprising: a

door-related hinge part, and a jamb-related hinge part forming an elongated supporting arm, an inner and an outer hinge link pivotingly articulated, in the manner of a four-joint linkage, each being connected to said door-related hinge part at one end and to said supporting arm at another end, said hinge being movable from an open to a closed position and vice versa, first and second pivot pins respectively at the supporting-arm end of said inner and outer hinge links, a thruster which is longitudinally displaceable and rotatable with relation to said second pivot pin, and having an end remote from said second pivot pin which is in the form of a cam thrusting against a crosspiece provided in said supporting arm, a spring under compressive bias thrusting with one end against said second pivot pin, the bias of said spring acting at another end of the spring by contin-



uously thrusting said cam against said inner hinge link at a distance from the supporting-arm end of said inner hinge link to produce a hinge closing torque as the hinge approaches the closed position, a slideway-and-stud coupling connecting said thruster with said inner hinge link, said coupling being engaged during closing movement for the purpose of turning the cam end of the thruster-toward said inner hinge link, said cam having a circuularly arcuate section that is concentric with an axis of said second pivot pin, and adjoining said arcuate section on said cam being a ramp section onto which said crosspiece passes from said arcuate section as the closed position of the hinge is approached with said cam end which has been turned by the coupling exerting the hinge closing torque against the inner hinge link.

4,457,048

APPARATUS FOR A SLAUGHTERHOUSE, MORE SPECIALLY FOR THE REMOVAL OF THE TOE-WEB OF PIGS

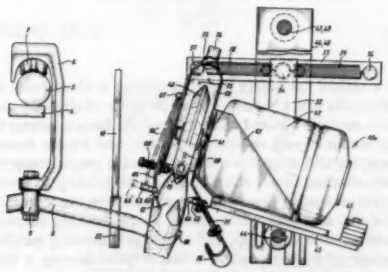
Adrianus Dreves, Wehl, Netherlands, assignor to North West Engineering B.V., Netherlands

Filed Oct. 19, 1981, Ser. No. 312,732

Claims priority, application Netherlands, Oct. 21, 1980, 8005798

Int. Cl.³ A22B *5/20*

U.S. Cl. 17—1 R **7 Claims**



1. An apparatus for the removal of a toe-web from the hindleg of a slaughtered pig, said slaughtered pig having been hung with the tendons of said hindleg on a coat-hook-shaped carrying-yoke, the latter being pivotable about a vertical axis, being hung on a horizontal conveyor, and being uniformly moved forward, said conveyor including a carrying structure and said carrying-yoke for passing along a toe-web cutting station, comprising, in combination:

a rotatable driven-milling-cutter having a cutting wheel adapted for cutting said toe web;

an orientation-means, fitted on the carrying structure of the conveyor, which, over a limited trajectory of the conveyor path in the area of the toe-web cutting station, orients the vertically hanging body on its carrying-yoke with respect to the direction of transportation by pivoting said vertically hanging body about the vertical rotation axis of the yoke, and maintaining a line connecting both hindlegs perpendicular to the conveyor path during the removal of the toe-web;

supporting means for rotatingly supporting said cutting wheel while the axis of rotation of the cutting wheel is continuously maintained in a vertical plane perpendicular to the conveyor path, said supporting means being pivotable about at least one axis parallel to the direction of transportation; and

guiding means, fitted on said supporting means, for self-orientation of said cutting wheel in relation to the hindleg of the pig.

4,457,049

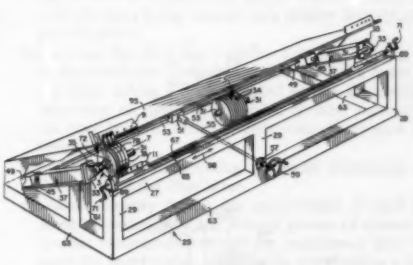
METHOD FOR TRAINING GIN SAWS AND GINNING RIBS FOR COTTON GINS

Bobby D. Hudson, deceased, late of Chandler, Ariz., and by Bobby J. Hudson, administratrix, Chandler, Ariz. 95224

Division of Ser. No. 317,303, Nov. 2, 1981, Pat. No. 4,400,851. This application Aug. 25, 1983, Ser. No. 526,432

Int. Cl.³ D01B *1/08*

U.S. Cl. 19—48 R **9 Claims**



1. A method for training a gin saw assembly and a ginning rib assembly used in a cotton gin, said method comprising the steps of:

removing the gin saw assembly and the ginning rib assembly from the cotton gin;

mounting said gin saw assembly onto a first mounting element;

moving a template having a plurality of alignment marks thereon representing proper spacing of individual gin saw blades of said gin saw assembly to a position adjacent to said gin saw blade;

slowly rotating said gin saw blades and comparing the positions of the peripheral portions of each gin saw blade to the position of a corresponding alignment mark on said template and manually training that gin saw blade as necessary to accurately align peripheral portions of that gin saw blade with its corresponding alignment mark;

moving said template away from said gin saw blade;

mounting the ginning rib assembly adjacent to said gin saw assembly onto a second mounting element and aligning the gaps between adjacent individual ginning ribs of the ginning rib assembly with respective ones of the gin saw blades;

moving the first mounting element toward the ginning rib assembly and causing the individual gin saw blades to pass into the gaps between adjacent ginning ribs;

comparing the position of each gin saw blade to the position of the adjacent ginning ribs to determine if that gin saw blade is accurately centered in the gap between the adjacent ginning ribs;

manually adjusting the ginning ribs as necessary to cause the gap to be located so that the gin saw blade is accurately centered in that gap; and

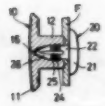
removing the gin saw assembly and ginning rib assembly from the first and second mounting elements, respectively, and re-installing the gin saw assembly and ginning rib assembly in the cotton gin.

4,457,050

SNAP-FIT BUTTON

Yoshihiro Kanzaka, Nyuzen, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Feb. 2, 1982, Ser. No. 345,027
Claims priority, application Japan, Feb. 6, 1981, 56-15493[U]
Int. Cl.³ A44B *1/38*
U.S. Cl. 24—108 **7 Claims**



1. A button comprising:

(a) a button part including a base and a female shank extending from said base and having therein an axial bore open at one end and extending at the other end into said base, said other end being closed;

(b) a fastener part having a head and a male shank extending from said head and adapted to fit forcibly into said axial bore in said female shank, said male shank being complementary in shape to said axial bore and having an enlarged conical end portion, said conical end portion having a maximum free diameter larger than the inside diameter of said axial bore; and

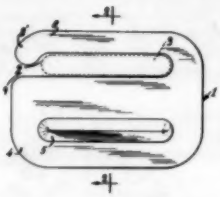
(c) one of said female shank and said male shank having passage means for allowing air to escape from said axial bore when said male shank is forced axially into said bore, said passage means comprising at least one slot extending axially in said female shank and opening into said axial bore in said female shank.

4,457,051

SLIDER FOR RIBBONS AND ASSEMBLING PROCESS THEREOF

Dario Bartolini, Impruneta, Italy, assignor to Lovable Industriale S.p.A., Bergamo, Italy

Division of Ser. No. 968,187, Dec. 11, 1978, Pat. No. 4,315,351.
This application Oct. 22, 1981, Ser. No. 313,988
Int. Cl.³ A44C *5/18*
U.S. Cl. 24—198 **4 Claims**



1. A process for assembling a ribbon and a ribbon slider including a ribbon anchoring portion and a portion defining two slots separated by flexible opposite arms, said process comprising the steps of:

(a) securing a said ribbon to said slider anchoring portion by welding,

(b) pushing a punch, with a portion of said ribbon thereon, against said arms, temporarily bending said arms, until said ribbon passes beyond said arms, and

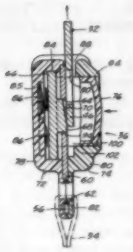
(c) retracting said punch, allowing said arms to recover an undeformed condition and leaving said ribbon threaded into said slots and arranged beyond said arms.

4,457,052

BUCKLE FOR CHILD'S CAR SEAT HARNESS

Peter Hauber, 9001 N. Glenoaks, Sun Valley, Calif. 91352

Filed Feb. 19, 1982, Ser. No. 350,303
Int. Cl.³ A44B *11/26, 11/00*
U.S. Cl. 24—656 **14 Claims**



1. In a child's car safety seat comprising a chair body in which the child sits, a harness anchored to the chair body and adapted to encircle a seated child therein, the harness comprising strap means having opposed free ends, and buckle means for connecting said strap free ends, said buckle means comprising a hasp attached to one strap free end and defining an opening beyond said strap free end, and a buckle on the opposite strap free end, said buckle comprising a rigid housing adapted to endwise receive said hasp, and within said housing parallel to the plane of hasp reception a center plate having a bail portion attached to said opposite strap and a central aperture therebeyond with which said hasp opening is adapted to register in the assembled relation of said buckle means, a generally flat release plate parallel to said center plate and defining a boss adapted to protrude through said center plate aperture and slope-surfaced to readily be received into said hasp opening

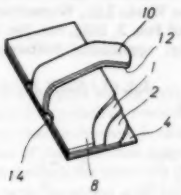
under symmetrical spring bias against said release plate from spring means laterally and vertically offset from said boss to secure said hasp in said buckle housing; button means carried by said housing having a vertical portion parallel to said boss and in passing relation thereto adapted to shift said release plate relatively away from said center plate against said spring bias in hasp releasing relation.

4,457,053

CABLE CLAMP

Katsumi Niwa, 874-2, Nakagiri, Mitake-cho, Kani-gun, Gifu-ken, Japan

Filed Aug. 17, 1982, Ser. No. 408,934
Int. Cl.³ A44B *21/00*; F16L *3/08*
U.S. Cl. 24—304 **14 Claims**



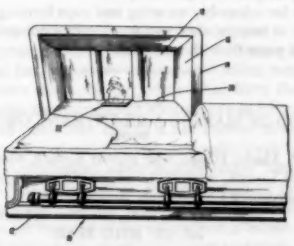
1. A cable clamp comprising:
a planar thin plastically deformable metal clamp body having an upper surface, a lower surface and at least one side edge;
an adhesive layer covering said lower surface of said clamp body;
a peeling layer covering said adhesive layer;
thin plastically deformable metal pressure element, having one end integrally attached to, and projecting from, at least one said at least one side edge and having a lower surface facing said upper surface of said clamp body;
at least one cushion member applied to said upper surface of said clamp body and said lower surface of each said pressure element; and
a plurality of notches formed in said clamp body and extending from said one side edge, each of said notches being positioned adjacent said one end of said pressure element.

4,457,054

CASKET SHELF

William K. Craft, Cincinnati, Ohio, and Wilfrid J. Scheele, Batesville, Ind., assignors to Batesville Casket Company, Inc., Batesville, Ind.

Filed May 6, 1982, Ser. No. 375,666
Int. Cl.³ A61G *71/00*
U.S. Cl. 27—1 **6 Claims**



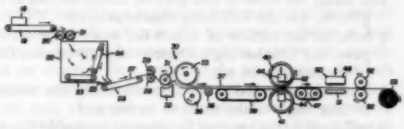
1. A casket shelf in combination with a casket of the type including a container and a lid hinged thereto, the lid having stiff upholstery mounted on an inside surface of the lid, said upholstery forming a slit, said shelf being removably attached within said upholstery in cantilever fashion with the lid in an open condition, said shelf comprising an exposed support portion and a retaining portion; said support portion including a support surface for supporting an article, said retaining portion extending at an angle relative to a section of said support portion to which it is adjoined; said retaining portion extending downwardly through said slit and lying behind a section of said upholstery and being urged to bear against the lid under the weight of an article carried by said support surface.

4,457,055

METHOD FOR FORMING NEEDLED, NON-WOVEN FIBER PADDING

Jere B. Ambrose; Donald D. Van Compernolle, both of Holland, Mich., and Alfred L. Davis, Thomson, Ga., assignors to Northern Fibre Products Co., Holland, Mich.

Filed Aug. 30, 1982, Ser. No. 412,573
Int. Cl.³ D04H *1/46*
U.S. Cl. 28—111 **1 Claim**



1. A method for making a relatively dense, thick pad of non-woven fabric fibers comprising essentially the steps of:
(a) shredding a mass of cloth-like material into fabric fibers;
(b) collecting and forming the fabric fibers into a continuous, single layer of loosely piled and randomly oriented fibers, with the layer being considerably thicker than the desired pad thickness;
(c) moving the fiber layer against a slowly rotating roller having tooth-like surfaces and then against a faster rotating roller having a rough toothed surface for tearing and shredding the fiber layer further thereby reconstituting the fiber layer to obtain a more even distribution of the fibers;
(d) momentarily compressing sequential increments along the length of the fiber layer;
(e) simultaneously during the compression of each increment, extending first and second groups of spaced apart needles transversely through the compressed layer increment for intertwining and thereby, interlocking a limited portion of the fibers within the compressed increment, wherein said compression step comprises passing the layer between a pair of opposed rollers for said compression, with each roller being formed of a cylindrical wall having numerous openings, with said first group of needles being located within one of said rollers and said second group of needles being located within the other of said rollers, and the needles of said first and second groups each being momentarily extended in an elliptical path through the roller openings for transversely extending through the layer during the time the rollers compress the layer increment then located between the rollers, and successively moving said needles toward the fiber layer so that said first group and then said second group of needles penetrate the fiber layer at the location of the compression;
(f) thereafter, finally needling the layer incrementally along its length by repeatedly extending a third group of a large number of closely spaced needles transversely through the layer for securing the fibers together to form the non-woven pad, said first and second groups of needles are of considerably lesser density than the third group of needles so that the needles of the first and second groups penetrate through the layer at relatively more widely spaced apart locations as compared with the needles of the third group,

and including compressing the portion of the layer being needled while finally needling it.

4,457,056

CARRYING OUT SAID PROCESS AND THE RESULTING JEWELS

Alain Plantureux, Montpellier, France, assignor to Jean-Louis Chancel, Geneva, Switzerland

Continuation of Ser. No. 233,768, Feb. 12, 1981, abandoned. This application Jun. 9, 1983, Ser. No. 501,747

Claims priority, application France, Feb. 25, 1980, 80 04057

Int. Cl.³ B23P *5/00*

U.S. Cl. 29—10 **5 Claims**

1. Industrial process for manufacturing jewelry, such as rings, by setting stones such as diamonds in a base, preferably of precious metal, which process consists in:

drilling a cylindrical hole of predetermined dimensions into said base;

forming, on the periphery of said hole and at a predetermined distance from the surface on which a stone is to be set, a groove of triangular cross-section;

and fitting the stone in said groove, characterized in that the groove, has the following characteristics:

a hole, on the surface of which the stone to be set will appear, said hole having a diameter slightly smaller than that of the stone to be set;

a base angle for the groove, substantially the same as the cutting angle of the stone to be set; and

a sufficiently thin external lip adapted to enable the stone to fit in said groove by clipping, while causing an elastic deformation of said external lip.

4,457,057

FLEXURE-RESISTANT ROLL FOR USE IN CALENDERS OR THE LIKE

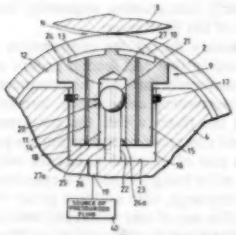
Josef Pav, Krefeld, Fed. Rep. of Germany, assignor to Kleinewegers GmbH, Krefeld, Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 318,062

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1980, 3042616

Int. Cl.³ B21B *29/00*

U.S. Cl. 29—116 AD **17 Claims**



1. A pressure applying roll for use in calenders or the like to define with a parallel complementary roll a nip for the passage of webs of paper, textile or other material, comprising a hollow cylindrical rotary shell having an internal surface; a stationary carrier element extending through and spacedly surrounded by said shell; bearing means including at least one bearing element interposed between said carrier element and said shell and having a second surface complementary to and adjacent to said internal surface; fluid-operated pressure generating means for urging said second surface toward said internal surface, comprising a cylinder member rigid with one of said elements, a piston member rigid with the other of said elements, and a seal interposed between said members, said cylinder member having a chamber for said piston member and a bottom face in said chamber, said piston member having an end face disposed opposite said bottom face; and a swivelling joint disposed between said members and including a first component constituting a socket extending inwardly from said face of one of said members and having a substantially cylindrical surface coaxial with said one member, said joint further comprising a second component rigid with and extending from said face of the other of said members and having a head tiltably received in said cylindrical surface, the diameter of said head closely approximating the diameter of said cylindrical surface so that said head is reciprocably slidable along said cylindrical surface in the direction of the axis of said cylindrical surface.

4,457,058

TAKE-OFF ROLL FOR FIBER BALES

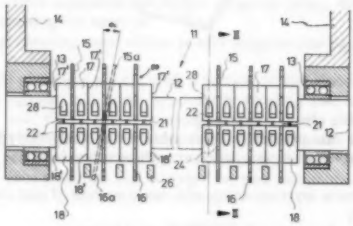
Rolf Binder, Raeterschen; David Egloff, Eschlikon, and Daniel Hanselmann, Winterthur, all of Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Feb. 2, 1982, Ser. No. 345,141

Claims priority, application Switzerland, Feb. 20, 1981, 1134/81

Int. Cl.³ B21B *31/00*

U.S. Cl. 29—125 **20 Claims**



1. A take-off roll for mechanically opening fiber bales by loosening fiber flocks therefrom, comprising:

a rotatable shaft;

a number of substantially circular toothed discs mounted along and upon said rotatable shaft;

each of said substantially circular toothed discs having an outer circumference provided with teeth;

each of said circular toothed discs comprising two half-discs provided with said teeth;

each of said half-discs being configured as a substantially half circular ring member;

an approximately half-circular ring-shaped cup member provided for each half-disc;

each of said cup members defining a cast cup in which there is embedded a related one of the half discs;

predetermined ones of said cast cups each including one said half-disc embedded therein being arranged to collectively form a toothed disc surrounding said shaft in an essentially ring-shaped configuration; and

means for releasably securing said cups forming said toothed disc to one another and for fixedly connecting said cups by a press fit with said shaft.

4,457,059

METHOD OF MAKING A RE-ENTRANT GROOVE HEAT PIPE

Joseph P. Alario, Hauppauge; Robert Kosson, Massapequa, and Edward Leszak, Amityville, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 24, 1982, Ser. No. 381,336

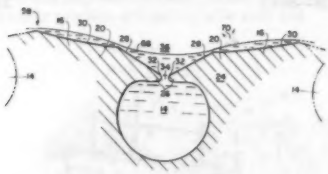
Int. Cl.³ B21D *53/00*

U.S. Cl. 29—157.3 H **4 Claims**

1. A method for making a convergent, re-entrant groove heat pipe comprising:

forming a desired length of seamless tube with a plurality of longitudinal capillary channels in a wall thereof and a like

plurality of re-entrant groove openings each providing communication between an associated one of the capillary channels and a central channel of the tube, said capillary channels and associated re-entrant openings being defined by a like plurality of ribs each projecting inwardly toward the central channel of the tube and having a head portion closest to the central channel relatively thicker than a base portion thereof whereby the re-entrant openings are narrower than the capillary channels;



aligning the tube with a mandrel having a plurality of spines shaped to correspond to a desired re-entrant groove entrance profile such that each spine is centered between adjacent ribs in one of the re-entrant groove openings;

drawing the mandrel through the tube such that rib material on either side of each re-entrant groove opening is displaced while material from a central portion of each rib remains undisplaced, resulting in a convergent, re-entrant groove profile;

sealing the tube at either end; and

injecting the tube with a suitable working fluid.

4,457,060

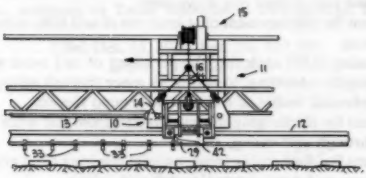
RAIL ANCHOR REMOVER

Jack E. Parks, and John H. Blanchfield, both of Charlotte, N.C., assignors to Southern Railway Company, Washington, D.C.

Filed Jul. 9, 1982, Ser. No. 396,700

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—239 **7 Claims**



1. An assembly for removing rail anchors gripped to the base of a rail, comprising means for lifting the rail away from attached railroad ties, means for moving said lifting means in a forward direction along the rail while lifted from the ties, a polyhedral wedge member fixedly secured to said lifting means for engaging an outer free end of a rail anchor to effect removal by movement of said free end outwardly away from the rail web during movement along said direction, said wedge member having an undersurface section extending in a rearward direction from a leading end of said wedge member for engaging the outer free end of the rail anchor, a tailpiece at the trailing end of said wedge member adjacent said undersurface section for engaging an outer edge of the rail base, said undersurface section sloping downwardly and inwardly from an outer side surface of said wedge member at a progressively steeper angle relative to said side surface toward said tailpiece.

4,457,061

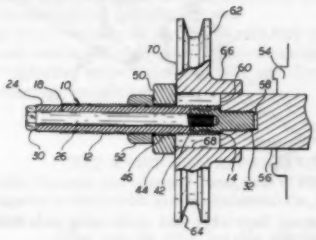
HARMONIC BALANCER INSTALLER

Lloyd R. Eason, Concord, Mich., assignor to Dowley Manufacturing, Inc., Spring Arbor, Mich.

Filed Mar. 31, 1982, Ser. No. 363,941

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—264 **6 Claims**



1. A tool for installing a harmonic balancer upon the end of an engine crankshaft wherein the balancer includes a hub having a bore defined thereon adapted to receive the crankshaft and an exterior face transversely intersecting the hub base, and the crankshaft having an axial threaded hole intersecting its end, comprising, in combination, an exteriorly threaded shaft having a diameter less than that of the balancer hub bore, an inner end, an outer end, and an axial bore intersecting said inner and outer ends, a coaxial recess defined in said shaft intersecting said inner end and shaft bore having a diameter greater than said shaft bore and a radial shoulder, an adapter received within said recess having an exteriorly threaded portion extending beyond said shaft inner end adapted to mate with the threads of the threaded crankshaft hole and having an internally threaded axial bore in alignment with and exposed to said shaft axial bore, a bolt rotatably received within said shaft bore having a threaded end threaded into said adapter axial bore and a headed end disposed adjacent said shaft outer end permitting rotation of said bolt to tightly draw said adapter against said recess radial shoulder to retain said adapter within said shaft recess, and thrust means threaded upon the exterior of said shaft adapted to bear against the balancer exterior face and force the balancer upon the end of the crankshaft when the shaft extends through the balancer hub bore and said adapter is threaded into the crankshaft threaded hole.

4,457,062

METHOD OF AND APPARATUS FOR DETECTING ENDS OF SUCCESSIVE FLY STRIPS CONNECTED BY A SLIDE FASTENER CHAIN

Tatsuo Osaki, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Sep. 2, 1982, Ser. No. 414,073

Claims priority, application Japan, Sep. 9, 1981, 56-140884

Int. Cl.³ B21D *53/50*; A41H *37/06*

U.S. Cl. 29—408 **11 Claims**

1. A method of detecting ends of successive fly strips connected end to end in substantially abutting relation by a pair of continuous slide fastener stringers, and fly strips being attached to a tape of one of the fastener stringers by at least one line of stitching dividing each fly strip into a first and a second flap, said method comprising the steps of:

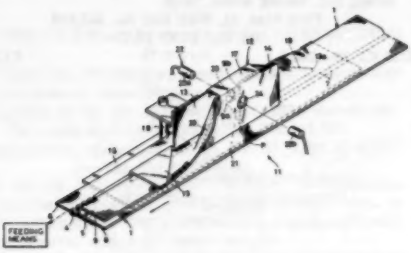
(a) feeding the successive fly strips lengthwise along a straight path, with the first flaps superimposed on the tape of the one fastener stringer and with the second flaps superimposed on the other fastener stringer;

(b) folding the successive second flaps over the respective first flaps as the fly strips pass a fixed point on said straight path;

(c) during said folding, temporarily deflecting a trailing end

of a preceding second flap to provide a triangular space between confronting ends of an adjacent pair of the successive second flaps when said confronting ends arrive at said fixed point; and

(d) sensing the presence of said successive triangular spaces.



4,457,063

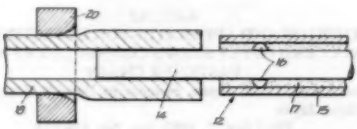
METHOD OF MAKING A HIGH TENSILE CONNECTION FOR OVERHEAD POWER LINES

Max Höckele, Bergtn-Steinach; Wolfgang G. Törpe, Neuhausen, and Karl Beham, Stuttgart, all of Fed. Rep. of Germany, assignors to Karl Pfisterer Elektrotechnische Spezialartikel GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 195,176, Oct. 8, 1980, abandoned, which is a continuation of Ser. No. 915,265, Jun. 13, 1978, abandoned. This application Aug. 18, 1982, Ser. No. 409,148

Int. Cl.³ B21D *39/00*; B23P *11/00*

U.S. Cl. 29—520 3 Claims



1. A process for forming a high tensile connection between a glass-fiber reinforced plastic rod extending axially from an end portion of an insulating cover and a metal rod having an end portion and a clamping channel in said end portion which extends along the longitudinal axis of said metal rod, comprising the steps of inserting the plastic rod into the clamping channel to a point where there remains an axial spacing between the end portion of the metal rod and the end portion of the insulating cover, and progressively in an axial direction deforming the metal rod from a location removed from its said end portion to said end portion having the clamping channel to radially decrease the diameter of the metal rod on the plastic rod and fill in the said axial spacing to the point where the end portion of the metal rod abuts the end portion of the insulating cover.

4,457,064

APPARATUS FOR GRINDING OFF THE OUTER SHELL OF A SPHERICAL BODY

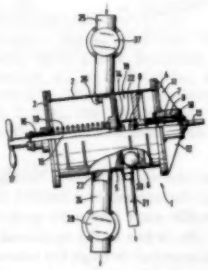
Hartmut Kronschnabel, Aachen, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 385,094

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123551

Int. Cl.³ B23P *23/00*

U.S. Cl. 29—564.7 26 Claims



1. Apparatus capable of grinding off the outer graphite shell of spherical HTR nuclear fuel elements comprising:

at least one pair of substantially parallel milling disks (5,6; 54,56) on an axis sufficiently close to the horizontal to allow particle material to drop out from between the disks, said disks facing each other across a work space, at least one of said disks having on its surface facing said work space (19,62) a hard helical radially ribbed surface for removing material from the surface of spherical bodies in said work space by relative grinding action, said radially ribbed helical surface rising to at least one radial down-step and being helical with respect to said axis;

means for driving at least one of said disks to produce relative rotation of said disks about an axis crossing said work space in such a manner that spherical bodies between said disks tend to move up said radially ribbed surfaces to and past said at least one down-step;

means for displacement of at least one of said disks along said axis;

a casing (2,49) enclosing the periphery of said work space;

means for admitting, to said work space through said casing, spherical bodies of a size to be ground therein;

means for discharging spherical bodies from said work space through said casing, and

means for discharging loose material resulting from grinding from said work space through said casing.

4,457,065

AUTOMATIC TOOL CHANGER FOR A LATHE

William C. Coate, Cincinnati, Ohio, assignor to The Lodge & Shipley Company, Cincinnati, Ohio

Continuation of Ser. No. 93,726, Nov. 13, 1979, Pat. No. 4,330,928. This application May 10, 1982, Ser. No. 376,813

The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.³ B23Q *3/155*

U.S. Cl. 29—568 3 Claims

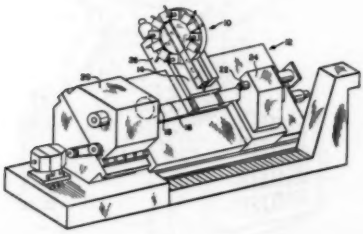
1. A tool changing and supporting apparatus for a turretless machine tool apparatus, such as a lathe, which has means defining a spindle axis for a workpiece and cross slide means for moving an active tool transversely of said spindle axis, comprising:

means defining a ready position on said cross slide:

a plurality of tool holder assemblies each holding at least one tool;

a tool storage magazine mounted to said cross slide means for movement therewith, said magazine carrying a plurality of said tool holder assemblies each selectably movable into the ready position;

a tool post for receiving a single tool holder assembly from said magazine and holding said tool holder assembly during work on a workpiece, said tool post being secured to said cross slide means in fixed orientation with respect thereto and disposed externally of said magazine between said ready position and said spindle axis; and



guide channel means mounted on said cross slide extending in a line along said cross slide transverse to said spindle axis between said ready position and said tool post for guiding a selected tool holder assembly to and from said tool post;

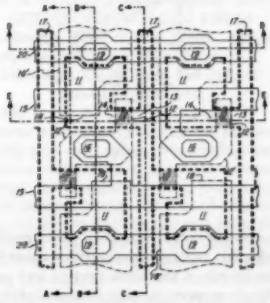
transport means having a rod reciprocable along said guide channel means between ready position and said tool post and having means on said rod engagable with the selected one of said tool holder assemblies only at said ready position for moving said selected tool holder assembly from said ready position and holding it at said tool post while the tool in said tool holder assembly performs work on a workpiece.

4,457,066

METHOD OF MAKING SINGLE-LEVEL POLYSILICON DYNAMIC MEMORY ARRAY

G. R. Mohan Rao, and Donald J. Redwine, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 15, 1980, Ser. No. 197,293
Int. Cl.³ H01L *21/28*
U.S. Cl. 29—571 **11 Claims**



8. A method of making a semiconductor device comprising the steps of:

applying a layer of conductive material over a face of a semiconductor body to form first and second electrodes overlying first and second semiconductor regions, respectively,

forming doped regions in said face in third and fourth regions adjacent said first and second regions, respectively,

applying an insulator on said face over said layer,

opening first and second holes in said insulator for connecting to said first and second electrodes, respectively, over areas generally spaced from said first and second semiconductor regions, respectively, and

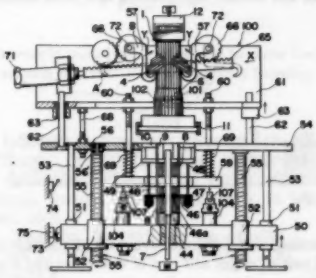
applying a conductive coating to said face and patterning said conductive coating to create separate first and second conductive strips extending into said first and second openings, respectively.

4,457,067

COIL INSERTING APPARATUS

Tokuhito Hamane, and Masaaki Tasai, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 21, 1982, Ser. No. 370,550
Claims priority, application Japan, Apr. 21, 1981, 56-61078
Int. Cl.³ H02K *15/06*
U.S. Cl. 29—736 **3 Claims**



1. An apparatus for inserting a coil into a stator core, comprising:

a coil inserting jig means for accommodating and retaining the coil therein,

a coil pusher means for inserting into the stator core the coil accommodated in said coil inserting jig means,

a coil lifting apparatus composed of a coil wrapping jig means for holding down the coil provided around the coil inserting jig means and for lifting up the coil to insert into the stator core, and

means for driving the coil wrapping jig means supporting the coil in response to a force applied upon the coil pusher means to hold down or to lift up the coil,

whereby resistance force caused during the coil insertion is reduced.

4,457,068

METHOD OF WRAPPING A CYLINDRICAL SHAPE

Leo A. Maier, Jr., 272 Langhorne Ave., Bethlehem, Pa. 18017

Filed Dec. 17, 1981, Ser. No. 331,528
Int. Cl.³ H01B *13/00*; H05K *3/00*; B21D *53/00*; B23P *15/26*
U.S. Cl. 29—825 **4 Claims**

1. A method of enclosing a plurality of individual members such as electrical cables, tubes, hoses or the like comprising:

(a) providing an elongated sheet material having a width which is not dependent on the size of the members and a pair of substantially parallel longitudinal edges and inside and outside faces, with a first hook fastener portion extending along, coextensive with and attached to one of said pair of edges and one of said faces and a second pile fastener portion extending along, coextensive with and

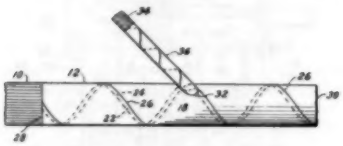
attached to the other of said pair of edges and the other of said faces, and

(b) helically wrapping said sheet material about said members with the first fastener portion continuously contacting and overlapping the second fastener portion and forcing the hook fastener portion on the one edge on one of said faces into interlocking engagement with the pile fastener portion of the other edge on the other face of the sheet material to releaseably secure the first and second fastener portions to each other and to secure said sheet material about said members and to form a continuous spiral joint secured together by said first and second fastener portions and an incremental portion of said first and second fatener portions may be opened and closed at any particular location to allow said members to be repaired, and

(c) opening an incremental portion of the spiral joint intermediate the ends thereof and repairing the members and closing the opened portion of the spiral joint.

2. A method of enclosing an essentially cylindrical shape including a plurality of individual members comprising:

(a) providing an elongated sheet material having a width which is not dependent on the size of the cylindrical shape and a pair of substantially parallel longitudinal edges and inside and outside faces, with a first hook fastener portion



extending along, coextensive with and attached to one of said pair of edges and one of said faces and a second pile fastener portion extending along, coextensive with and attached to the other of said pair of edges and the other of said faces,

(b) helically wrapping said sheet material about said plurality of individual members with the first fastener portion continuously contacting and overlapping the second fastener portion and forcing the hook fastener portion on the one edge on one of said faces into interlocking engagement with the pile fastener portion of the other edge on the other face of the sheet material to releaseably secure the first and second fastener portions to each other and to secure said sheet material about the individual members and to form a continuous spiral joint secured together by said first and said second fastener portions and an incremental portion of said first and second fastener portions may be opened and closed at any particular location to allow said members to be repaired and opened in its entirety to allow the sheet material to be reused, and

(c) forming an opening in said spiral joint intermediate the ends thereof by separating said first fastener portion from said second fastener portion and passing an individual member through said opening to form a branch line extending from the cylindrical shape.

4,457,069

SHARPENING DEVICE FOR A CHAIN SAW

Albert Close, Inglewood, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

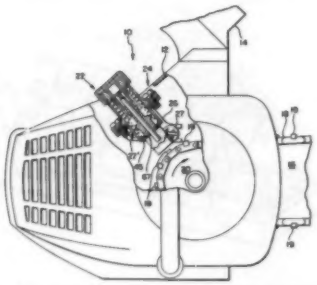
Filed Jan. 20, 1983, Ser. No. 459,349
Int. Cl.³ B23D 63/16
U.S. Cl. 30—138 **20 Claims**

1. In a chain saw of the type having an endless saw chain driven by power means supported by a chain saw housing, and a sharpening device to sharpen the cutters on said saw chain when said saw chain is in motion, said sharpening device comprising:

a. positioning means for connecting said chain sharpening device to said chain saw housing;

b. grinding means, movably connected to said positioning means, for grinding said cutters, said grinding means being movable from a first position spaced from said cutters to a second position engaging said cutters, and vice-versa;

c. actuator means, movably connected to said positioning means and responsive to an applied force, for causing said



grinding means to engage said cutters, said actuator means being movable from a retracted position to an actuated position, and vice-versa;

d. first biasing means, operatively connected to said actuator means and said grinding means, for yieldably urging said grinding means toward said second position and said actuator means toward said retracted position; and

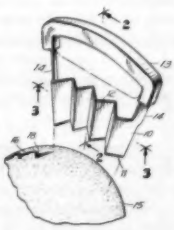
e. second biasing means, operatively connected to said actuator means and said positioning means, for yieldably urging said actuator means toward said retracted position.

4,457,070

FRUIT CROWNER

Frederick Reeves, 1777 Grand Concourse, Apt. 6-H, Bronx, N.Y. 10453

Filed Sep. 7, 1982, Ser. No. 415,322
Int. Cl.³ B26B 9/02
U.S. Cl. 30—314 **4 Claims**

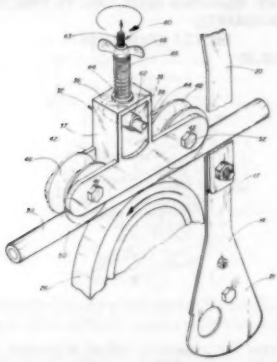


1. A fruit crowner comprising (a) a blade portion having a series of V-shaped, tapered corrugations extending substantially over the length of the blade portion and traversing the width of the blade portion, the edge of said blade portion at the tapered end of the corrugations being sharpened to form a cutting edge, said cutting edge being curved in the plane parallel to the longitudinal direction of the corrugations to conform substantially to the surface curve of the fruit, and (b) a handle attached to said blade portion.

4,457,071
APPARATUS FOR MEASURING COIL TUBING

Louis J. Alphonso, P.O. Box 1239, Chalmette, La. 70044

Filed Sep. 10, 1981, Ser. No. 300,958
Int. Cl.³ G01B 3/12
U.S. Cl. 33—134 R 6 Claims



1. An apparatus for measuring the longitudinal length of cable or tubing, comprising:

a. a primary support frame having a generally parallel pair of support arms;

b. at least one drive wheel rotatably mounted between said arms of said primary support frame;

c. a secondary support frame substantially transversely mounted on an immovable mount bolted between said parallel support arms of said primary support frame and adjustable in an up and down path on a vertical extension of said immovable mount, said secondary support frame supporting a pair of idler wheels for engaging the tubing to be measured between said pair of idler wheels and said drive wheel;

d. tension means in engagement between said secondary support frame and retaining means on the upper portion of said immovable mount for selectively imparting tension on said secondary support frame for further imparting tension on the tubing to be measured between said idler wheels and said drive wheel; and

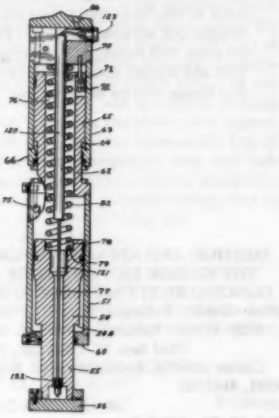
e. means for numerically registering the length of tubing travelled along said drive wheel.

4,457,072
CROSSHEAD AND BOLSTER SPACING CONTROL FOR SERVO CONTROLLED PRESS

Dennis H. Andersen, Minnetonka, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Apr. 7, 1982, Ser. No. 366,149
Int. Cl.³ G01B 7/02
U.S. Cl. 33—143 L 8 Claims

1. A transducer mounting for sensing the relative position of two parts relative to each other, wherein at least one of the parts also moves relative to a reference comprising a first housing adapted to be mounted at a known location with respect to a reference support, a first shaft telescopically slidably mounted inside said first housing and extending from one end thereof for movement along a first axis, first stop means cooperating between said first shaft and said first housing for limiting sliding movement of the first shaft relative to the first housing in a first direction, a second shaft fixed to said first housing and extending from an end of said first housing opposite from the first shaft, a second housing slidably mounted on said second shaft and movable along an axis generally parallel to the first axis, second stop means cooperating between said first housing and said second housing for limiting sliding movement of the second housing relative to the first housing in a second direction opposite from the first direction, bias means urging said first shaft and second housing to separate, and a

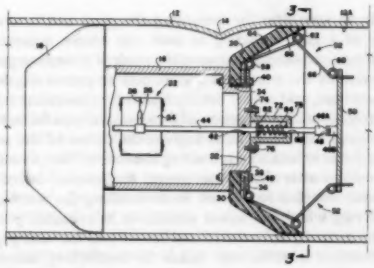


linear displacement transducer connected to sense the relative positions between said first shaft and second housing.

4,457,073
PIPELINE PIG HAVING IMPROVED MEANS OF SENSING CHANGES IN THE INTERNAL CONFIGURATION OF A PIPELINE

Larry D. Payne, Owasso, Okla., assignor to T. D. Williamson, Inc., Tulsa, Okla.

Filed Sep. 28, 1982, Ser. No. 425,433
Int. Cl.³ E21B 47/08; G01B 5/12, 5/20
U.S. Cl. 33—178 F 6 Claims



1. A pipeline pig having improved means of sensing changes in the internal configuration of a pipeline through which the pig is passed, comprising:

a longitudinal body having a forward and rearward end and having instrumentation means therein;

a radial cup of elastomeric material supported to said body, the cup having a circumferential rearwardly extending flange portion having an inner and outer surface, the outer surface resiliently engaging the internal surface of the pipeline through which the pig passes;

a longitudinally positionable stylus shaft supported by said body, the inner end thereof having means of actuating said instrumentation means;

a transfer plate means affixed in a radial manner to the outer end of said stylus shaft rearwardly of said cup; and

a plurality of spaced apart sensor members each having the inner end thereof affixed to said pig body and having the

outer end thereof affixed to said transfer plate, each sensor member being formed of a small diameter rod, each member having a first integral coil adjacent the point of attachment of the inner end to said pig body, having a second integral coil adjacent the point of attachment to said transfer plate, and having a third integral coil intermediate the first and second coils, the third coil being adjacent said cup flange portion inner surface.

4,457,074

METHOD AND APPARATUS FOR SYNCHRONIZING THE SENSOR MOVEMENT OF A PITCH AND/OR CONCENTRICITY MEASURING DEVICE FOR GEARS

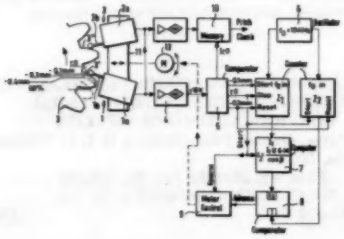
Peter Golder, Ettlingen, Fed. Rep. of Germany, assignor to Willy Höfler, Karlsruhe, Fed. Rep. of Germany

Filed Sep. 17, 1982, Ser. No. 420,504

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1981, 3141350

Int. Cl.³ G01B 5/20

U.S. Cl. 33—179.5 R **9 Claims**



9. In an apparatus for measuring the pitch and/or concentricity of a gear including at least one sensor mounted for movement into the gap between the teeth of a rotating gear for deflection by the gear for a certain path to permit the desired measurement, said sensor having means for generating a signal proportional to the deflection of the sensor, means for initiating the desired measurement at a given deflection of the sensor, means for automatically retracting the sensor from its measuring position after the measurement, and means, including a computer coupled to a timer, for controlling the waiting period, during which the sensor remains in its retracted position, and the renewed entrance of said sensor into the next gap; the improvement wherein said means for controlling includes: a pulse oscillator as said timer; a first counter having its input connected to the output of said pulse oscillator; means, responsive to the output signal from said sensor, for causing said first counter to start counting at a first deflection which is lower than said given deflection, and for causing said first counter to cease counting at a second deflection, which is higher than said first value, and to transfer the count to said computer in which are stored the pitch of the gear to be tested and the rotary path desired to be traversed by the gear during the waiting period, said computer calculating the waiting period from the count received from said first counter and said stored data; a further counter having its input connected to the output of said timer; means for causing said further counter to start counting upon the beginning of said retraction of said sensor; and a comparator for comparing the calculated waiting period produced by said computer with the time information represented by the count in said further counter and for actuating the forward movement of said sensor when there is coincidence.

4,457,075

METHOD AND AN APPARATUS FOR MEASURING WHEEL ALIGNMENT OF MOTOR VEHICLES

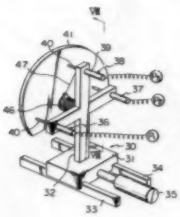
Yoichi Murata, Nagoya, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 7, 1981, Ser. No. 328,253

Claims priority, application Japan, Dec. 15, 1980, 55-175895; Apr. 2, 1981, 56-46459[U]

Int. Cl.³ G01B 5/255

U.S. Cl. 33—203.15 **5 Claims**



1. An apparatus for measuring wheel alignment of motor vehicles, comprising a sensor plate member adapted to contact an outer side face of a rubber wheel tire bearing the weight of said motor vehicle, said sensor plate member being pivotably supported at about the central portion thereof by a stay member, means for supporting and bringing said sensor plate member in contact with said outer side face of the rubber wheel tire of one of a pair of front or rear wheels of said vehicle, and sensor means for detecting the direction of said sensor plate member in the horizontal level which is parallel to said floor surface on which said vehicle is placed, said sensor means including a sensor rod extending horizontally from said stay member to said sensor plate member to measure the direction of said sensor plate member in the horizontal level.

4,457,076

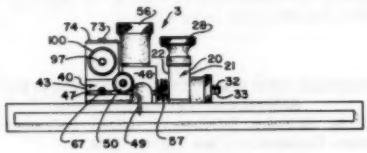
BOW SIGHT

Albert E. Heck, 1131 Grand Prix, St. Charles, Mo. 63301

Filed Sep. 29, 1982, Ser. No. 427,656

Int. Cl.³ F41G 1/46

U.S. Cl. 33—265 **7 Claims**



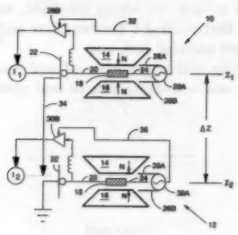
1. An adjustable bow sight mechanism comprising an elongated base, a sight support assembly slidably mounted on said base for travel longitudinally of the base, said sight support assembly comprising a sight carriage block, a turret unit rotatably mounted on said sight carriage block and a sight assembly mounted on said turret unit, an anchor block having a flat surface on a side away from the sight carriage block, biasing means exerting constant bias against the anchor block and sight carriage block, a threaded elevation adjustment rod mounted in said sight carriage block and extending through said anchor block, an elevation adjustment knob with a radial flat surface adjacent the flat surface of the anchor block threaded on said elevation adjustment rod, said anchor block and elevation adjustment knob having click adjustment means in said flat surfaces.

4,457,077

BOREHOLE GRADIOMETER

Theodore V. Lautzenhiser, Tulsa, Okla., assignor to Standard Oil Company, Chicago, Ill.

Filed Jul. 5, 1983, Ser. No. 510,797
Int. Cl.³ E21B 47/022
U.S. Cl. 33—304 12 Claims



1. A borehole gravity gradiometer for measuring the differences in gravity at different depths within a wellbore, comprising:

(a) a first gravity measuring means disposed in said wellbore and including means to form a first control current in response to the force of gravity acting at a first depth upon said first gravity measuring means;

(b) a second gravity measuring means disposed within said wellbore in spaced position from said first gravity measuring means and including means to form a second control current in response to the force of gravity acting at a second depth upon said second gravity measuring means; and

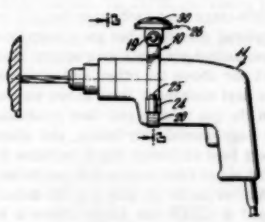
(c) circuit means for providing said first control current as a bias current to said second control current, whereby said second control current is proportional to the differences in gravity sensed by said first and second gravity measuring means.

4,457,078

LEVELING DEVICE FOR POWER TOOLS

Adalbert W. Suchy, 118 Saratoga Ave., Yonkers, N.Y. 10705

Filed Dec. 9, 1981, Ser. No. 328,946
Int. Cl.³ B23B 45/14
U.S. Cl. 33—334 6 Claims



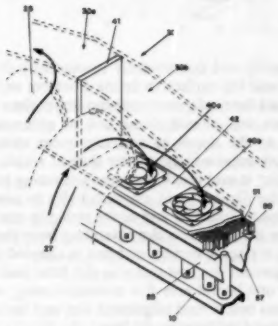
1. A leveling attachment for power tools having a body and a material cutting tool projecting from the body comprising a unitary member of relatively rigid material having an inverted V-shaped portion with two downwardly and outwardly extending legs having inclined surfaces on the underside thereof and a bifurcated support extending upwardly from said V-shaped portion, said support having a pair of spaced parallel legs aligned with the legs of said V-shaped portion and aligned openings extending through said legs, a bolt extending through said openings and having a cooperating nut, a flexible strap having perforated end portions with one end portion engaging one end of said bolt and lying against the outer surface of one of said legs of said bifurcated support and the adjoining leg of said V-shaped portion and the other end engaging the other end of said bolt and lying against the outer surface of the other of said legs of said bifurcated support and the adjoining leg of said V-shaped portion, means on said strap for adjusting the length thereof, said strap being adapted to encircle the body of said power tool with said inclined surfaces engaging said body and said adjusting means functioning to secure said strap and said unitary member to said body, and adjustable leveling means including a support extending therefrom, said support having an opening therein and positioned between the legs of said bifurcated support and in engagement with said bolt whereby said level is aagularly movable relative to said power tool to facilitate positioning of the material cutting tool at desired angles relative to said material being cut.

4,457,079

BOTTLE COOLER

Robert M. Jodrey, Westboro, and Paul Croci, Southboro, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Mar. 15, 1982, Ser. No. 357,942
Int. Cl.³ F26B 15/18
U.S. Cl. 34—105 8 Claims



1. Apparatus for convectively cooling articles travelling on a moving conveyor, comprising:

a plenum chamber having a floor,

means for supplying air to said plenum chamber to pressurize said chamber at above ambient pressure;

a plurality of fans located in the floor of said plenum chamber for directing air streams toward the conveyor;

a lattice of open cells located downstream of said fans and upstream of the conveyor, each of the cells having a passage with an axis in the direction of the conveyor so as to reduce turbulence of the air streams passing therethrough; and

at least two plates located downstream of the lattice of open cells and straddling the articles travelling on the conveyor, said plates converging in the direction of said conveyor so as to direct said air streams uniformly over the articles.

4,457,080

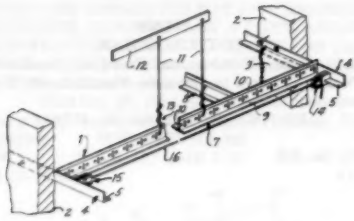
FLEXIBLE GAGE CLAMP APPARATUS FOR SUPPORTING A FLEXIBLE GAGE LINE

Casimer J. Glan, 3732 N. Richards, Milwaukee, Wis. 53212

Continuation of Ser. No. 080,096, Sep. 28, 1979, abandoned. This application Dec. 18, 1981, Ser. No. 331,961
Int. Cl.³ G01C 15/10
U.S. Cl. 33—404 8 Claims

1. A guide line apparatus for use in aligning T-shaped support members of a drop in ceiling with a projecting member of a support structure by releasable attachment of the apparatus

to said projecting member of the support structure, comprising a clamp unit having a groove with a base reference wall and said base reference wall in use being located in engagement with said projecting member of the support structure, said clamp unit having a releasable clamp member adapted to move into said groove and secure the clamp unit to the projecting member with the base reference wall engaging the support structure, a guide line unit including a block body having an outer end surface and a top surface, said body projecting outwardly and forwardly from the clamp unit opposite the groove and outwardly of the support structure, said guide line unit being connected to the clamp unit and having an elongated alignment slot substantially centrally located in said block and in spaced relation to the opposite sides of said block and projecting inwardly and downwardly respectively from said end surface and said top surface to define a bottom surface located parallel to said base reference wall but lower than the plane of said reference wall of said clamp unit by an amount substantially equal to the depth of said alignment string, said slot having a depth substantially greater than its width, at least one lateral arm slot in said block body and extending laterally at an angle from the plane of said alignment slot to one side of the guide line unit to direct an end of the string to said one side of the guide line unit, said arm slot extending from the top surface and the side surface whereby said line is adapted to be placed into said alignment slot and said arm slot from said top surface, said at least one lateral arm slot communicating with a string locking means below said alignment slot and including a line gripping recess for locking said line.



4,457,081
COOLING PROCESS FOR MATERIAL BEDS OF BULK MATERIALS

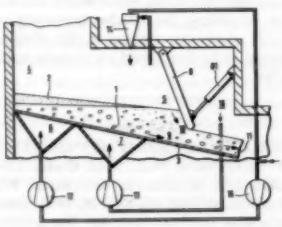
Karl von Wedel, Amselstrasse 5, 3057 Neustadt 1, Fed. Rep. of Germany

Filed Aug. 9, 1982, Ser. No. 406,184

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1981, 3131514

Int. Cl.³ F26B *7/00*; F27D *15/02*

U.S. Cl. 34—20 **17 Claims**



1. A process of cooling a material bed of bulk material such as cement clinker, said process comprising the steps of

(a) conveying said material bed on a grate cooler comprising a grate, a free end of high material temperature and a discharge end of a respectively lower material temperature in a conveying direction from said feed end towards said discharge end at a predetermined conveying rate,

(b) cooling said material bed while conveying it with a cooling medium such as air,

(c) pressurizing said cooling medium underneath said grate to an extent sufficient to penetrate said grate and said material bed in an upward direction and essentially perpendicular to said conveying direction, said cooling medium thus first cooling a bottom layer and then an upper layer of said material bed, and

(d) decelerating said upper layer of said material bed with respect to said conveying rate of said grate.

4,457,082
HEAT EXCHANGER

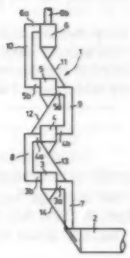
Wilfried Kreft, Ennigerloh; Wolfgang Rother, Stromberg; Peter Tiggesbaumker, Oelde; Karl Menzel, Beckum; Herbert W. Schmelter, Ennigerloh, and Heinrich Weber, Beckum, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Mar. 18, 1982, Ser. No. 359,198

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111527

Int. Cl.³ F26B *17/14*

U.S. Cl. 34—57 E **7 Claims**



1. In a multiple-stage heat exchanger for heat treatment of fine-grained material wherein a hot gas stream flows upwards through the heat exchanger containing several heat exchanger stages arranged one above the other, and wherein material is supplied to the heat exchanger from above and is repeatedly separated from the gas stream and then reintroduced to the heat exchange stage immediately below, and wherein at least one of the lower heat exchange stages includes a deflector/separator having a gas inlet pipe and a gas outlet pipe offset relative to each other on the periphery of the deflector/separator and arranged at a different height above a hopper, and wherein at least the uppermost heat exchange stage has a cyclone with the horizontal gas inlet pipe, the improvement wherein:

(a) the deflector/separator has an upper portion of cylindrical cross-section above its hopper with which said gas inlet pipe and said gas outlet pipe communicate;

(b) the gas inlet pipe and the gas outlet pipe are substantially horizontal and the gas inlet pipe communicates tangentially with said cylindrical upper portion; and

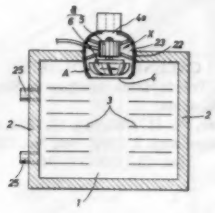
(c) the individual heat exchange stages have material delivery lines which communicate with the respective deflector/separator gas inlet pipe of the heat exchange stage immediately below.

4,457,083

HEAT GENERATING APPARATUS AND ITS PROCESS

Nobuyoshi Kuboyama, 28-9-1, Shimomiyamori, Aza, Miyamorimura, Kamihei-Gun, Iwate-ken, Japan

Filed Dec. 11, 1981, Ser. No. 329,818
Claims priority, application Japan, Mar. 31, 1981, 56-46436
The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.
Int. Cl.³ F26B 9/06
U.S. Cl. 34—92 5 Claims



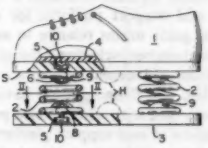
1. A heat generating apparatus for generating heat, comprising:
a chamber;
said chamber being sealed against entry of air;
an air outlet in said chamber;
an air suction opening in said outlet of said chamber;
rotary means mounted in said air suction opening effective to reduce air pressure in said chamber to a reduced balanced level by forcibly suctioning air from said chamber and discharging said air outside said sealed chamber;
an air friction heat generating means in a rotation area of the rotary means, said air friction heat generating means being effective to add heat to air remaining in said chamber; and
means for maintaining said air pressure in said chamber at said reduced balanced level whereby air remaining in the interior of said chamber is heated by air friction heat at said reduced balanced air pressure.

4,457,084

HOPPING AND DANCING SHOES

Hiroshi Horibata, Mitaka House No. 25-20, 5-chome, Kamirenjaku, Mitaka-shi, Tokyo 181, Japan; John W. Sondreal, 4109 Pleasant Ave., Norfolk, Va. 23518, and Henry Chu, 7-3 Jen Ai Rd. Sec. 2, Taipei, Taiwan

Filed Apr. 8, 1981, Ser. No. 252,162
Int. Cl.³ A43B 3/10, 13/18
U.S. Cl. 36—7.8 4 Claims



1. Hopping shoe comprising a sole member, a base member spaced from said sole member and a spring having outer coils in spaced parallel planes which are perpendicular to the axis of said coils and outer axial end portions, said spring having a diameter substantially equal to the width of said sole member and said base member, and connection means fixedly attaching said sole and said base to the axial outer ends of said spring, said connection means also positioning said sole and said base to come into contact with its juxtapositioned outer diameter coil of said spring wherein the static weight of the shoe wearer will unify, for rotational displacements, said sole and said base by friction to its justapositioned outer full diameter coil of said spring.

4,457,085

EXCAVATING BUCKETS

Carroll H. Arnold, Westminster, Mass., assignor to Wain-Roy, Inc., Hubbardston, Mass.

Continuation of Ser. No. 238,801, Feb. 27, 1981, abandoned, which is a continuation-in-part of Ser. No. 129,489, Mar. 10, 1980, Pat. No. 4,279,085. This application Nov. 29, 1982, Ser. No. 445,152
The portion of the term of this patent subsequent to Jul. 21, 1998, has been disclaimed.
Int. Cl.³ E02F 3/76
U.S. Cl. 37—103 23 Claims

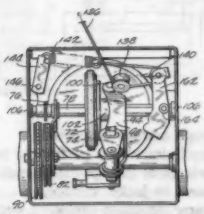
1. In an excavating bucket including two sides and a curved bottom connecting said sides, said bottom having a front scooping edge, and a plurality of rippers protruding downwardly from said bottom and facing towards said scooping edge, said rippers being staggered at varying distances from said edge towards the back of said bucket and at varying distances from the sides of said bucket, that improvement wherein each of said rippers defines a cutting edge and said rippers are positioned such that said ripper cutting edges lie in an arc.

4,457,086

SNOWBLOWER HAVING IMPROVED AUGER AND TRACTION DRIVE CONTROL

Roger J. Bacon, Plymouth, Wis., assignor to Gilson Brothers Company, Plymouth, Wis.

Filed Sep. 11, 1980, Ser. No. 186,274
Int. Cl.³ E01H 5/09
U.S. Cl. 37—257 25 Claims



1. A snowblower comprising
a frame,
at least one wheel for supporting the frame for movement along the ground,
means for propelling snow including a rotatable auger supported by said frame,
an engine supported by the frame, the engine including a first rotationally driven output shaft, and a second rotationally driven output shaft,
means for selectively drivingly connecting the first output shaft to the auger for rotatably driving the auger,

means for selectively drivingly connecting the second output shaft of the engine to the wheel for driving the wheel, and

means for controlling driving connection of said engine and said auger and for controlling driving connection of said engine and said wheel, said controlling means including means for causing engagement of said auger drive before engagement of said traction drive and disengagement of said traction drive before disengagement of said auger drive,

said means for drivingly connecting the engine and the auger including a drive belt, means for tensioning said drive belt including a first movable member movable between a first position and a belt tensioning position, and said means for drivingly connecting the engine and the wheel including a second drive belt, and means for tensioning said second drive belt including a second movable member movable between a first position and a belt tensioning position, and said means for controlling driving connection including a pulley means connected to said first movable member and a cable having one end connected to said second movable member and being reaved over said pulley means, and said means for controlling driving connection further including a control handle supported by said frame for pivotable movement, said cable being connected to said control handle and causing pivotal movement of said first movable member to said first drive belt tensioning position when said control handle is moved to a first position and causing movement of said second movable member to a belt tensioning position when said handle moves past said first position to a second position.

4,457,087

STEAM TROUGH MANGLE WITH HEAT RECYCLING APPARATUS

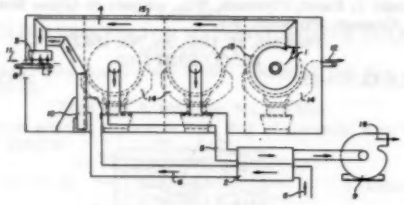
Christian Wolff, and Gerhard Lippold, both of Karl Marx Stadt, German Democratic Rep., assignors to VEB Kombinat Textima, Karl Marx Stadt, German Democratic Rep.

Filed Mar. 4, 1982, Ser. No. 354,865

Claims priority, application German Democratic Rep., Jul. 20, 1981, 2319111

Int. Cl.³ D06F *65/10*

U.S. Cl. 38—55 **7 Claims**



1. A steam trough mangle comprising

(A) a mangle cylinder with a perforated jacket surface,

(B) a mangle trough at least partially enclosing said mangle cylinder around its jacket surface,

(C) an outer frame structure enclosing said mangle cylinder and trough,

(D) a device for suctioning exhaust air from the interior of said mangle cylinder, said exhaust air enriched with vapor from ironing of laundry by said mangle cylinder and trough,

(E) a device for suctioning fresh air from outside said frame structure,

(F) means for transferring heat from one stream of air to another stream of air comprising two flow chambers one of which is connected with said fresh air suctioning device, the other of which is connected with said exhaust air suctioning device, and

(G) an air distributing device connected with the flow chamber of said heat transfer means that is connected with said fresh air suctioning device, and also connected with said exhaust air suctioning device, in which said exhaust air is separated into recirculating air and discharge air, said discharge air being fed to the flow chamber of said heat transfer means that is connected with said exhaust air suctioning device and said recirculating air remaining in circulation within said steam trough mangle.

4,457,088

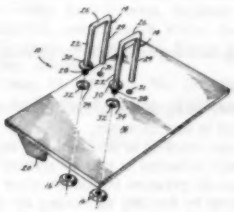
CALENDAR HOLDER

Jerry L. Sharber, Toledo, Ohio, assignor to Sheller-Globe Corporation, Toledo, Ohio

Continuation of Ser. No. 417,090, Sep. 13, 1982, abandoned. This application Aug. 2, 1983, Ser. No. 518,978

Int. Cl.³ G09D *3/04*

U.S. Cl. 40—120 **2 Claims**



1. A document holder for supporting a plurality of papers each having at least one aperture formed therein comprising:

a generally planar support platform provided with first and second spaced apart apertures, said first aperture having a predetermined cross section, said platform provided with a recessed portion on the upper surface thereof surrounding said second aperture and an integral boss portion on the lower surface thereof surrounding said second aperture;

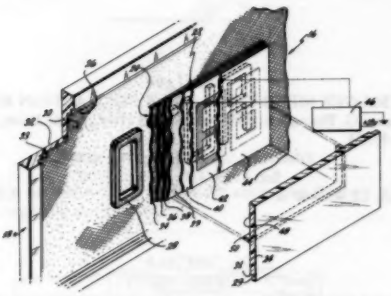
at least one guide means for insertion into the aperture formed in the papers, said guide means including a generally inverted U-shaped member having a first leg releasably inserted into said first aperture and a second leg releasably inserted into said second aperture, said first leg having a cross section substantially conforming to the cross section of said first aperture for resisting any lateral movement of said first leg relative to said support platform, said second leg provided with a stop member engaged with said support platform for determining the height of said guide means relative to said support platform, said stop member including a flange portion extending radially from said second leg and securely fastened to said second leg, said flange portion having a lower support surface engaged with said recessed portion formed in the upper surface of said support platform for stabilizing said guide means relative to said support platform and maintaining said second leg in generally perpendicular relationship with the upper surface of said support platform, said flange portion having an upper surface and a thickness approximately equal to the depth of said recessed portion, whereby said upper surface of said flange portion and said upper surface of said support platform are substantially coplanar; and

fastening means engageable with the lower end of said second leg and said boss portion of said platform for maintaining said stop member in engaging relationship with said platform.

4,457,089
DECORATIVE, ILLUMINATED AUTOMOTIVE REFLECTOR

Wilbert H. Phillips, Jr., 19771 Quiet Bay Ln., Huntington Beach, Calif. 92648

Filed Oct. 2, 1981, Ser. No. 308,044
Int. Cl.³ G09F *13/22*
U.S. Cl. 40—544 6 Claims

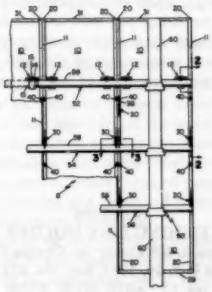


1. An apparatus comprising:
a lens panel having a reflecting portion and a translucent insignia portion;
a screen disposed at least behind said insignia portion, said screen being at least partially reflective to light incident thereon through said insignia portion, and at least partially transparent to light therethrough from behind said screen, and wherein said screen is a plurality of line screen prints, each one of said plurality of prints being angularly oriented to each other one of said plurality of line screen prints to avoid moire patterns and
a light source disposed behind said screen, whereby a day reflector is devised which reflectively displays said insignia portion under daylight, and which illuminates said insignia portion during night.

4,457,090
MODULAR WHEEL SUPPORTED BILLBOARD PANELS WITH LOCKING WEDGES

Paul F. McDonough, 159 Warren Ave., Milton, Mass. 02187

Filed Sep. 17, 1981, Ser. No. 303,142
Int. Cl.³ G09F *15/00*
U.S. Cl. 40—624 11 Claims

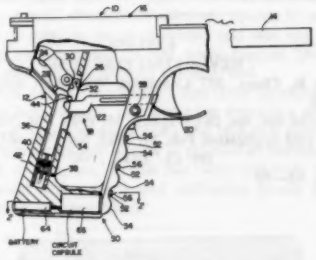


1. An advertising sign assembly comprising a plurality of panels adapted to be mounted on a generally vertical frame that includes at least two vertically-spaced elongated horizontal rails and to be positioned in edgewise abutment with each other to form a planar front advertising surface, each of said panels comprising:
a pair of horizontally-spaced supports fixedly attached to an upper portion of the back surface of said panel, each of said supports including a grooved member adapted to engage an upper one of said horizontal rails when said panel is mounted on said frame;
at least one locking element track attached to the back surface of and extending generally vertically of said panel;
at least one locking element mounted on said track for sliding movement therealong between a first position spaced above a lower one of said rails towards and into a second position in which said locking element engages said lower one of said rails,
said locking element including
a first portion defining a rearwardly-facing engagement surface extending generally longitudinally of said track and slidingly engaging a longitudinally-extending forwardly-facing surface defined by said track and,
a second portion fixed relative to and extending rearwardly from said first portion, said second portion defining an inclined locking surface spaced rearwardly from said track and facing generally towards the back surface of said panel, and being adapted to hook over and engage a lower one of said horizontal rails when said panel is mounted on said frame with said supports engaging said upper one of said horizontal rails and said locking element is slid relative to said track from said first position towards and into engagement with said lower one of said horizontal rails; and,
means for releasably securing said locking element in said first position when said panel is being placed onto said frame and for permitting said locking element to be slid into said second position when said panel is mounted on said frame with said supports engaging said upper one of said horizontal rails.

4,457,091
FIREARM SAFETY LOCK

Robert S. Wallerstein, 1888 Century Park East, Suite 1888, Los Angeles, Calif. 90067

Filed Apr. 14, 1982, Ser. No. 368,377
Int. Cl.³ F41C *17/08*
U.S. Cl. 42—1 LP 4 Claims



1. In a firearm including a handle, a barrel connected to the handle, and a firing mechanism, a safety device comprising:
a plurality of independently actuatable members;
electronic circuit means for determining whether the sequence in which said members are actuated is a predetermined sequence; and
interlock means, operated by said determining means only when said members are actuated in said predetermined sequence, for preventing the operation of said firing mechanism, and hence of said firearm, unless said members are so actuated, said actuatable members comprising at least three electrical switches; the handle of said firearm including a finger grip; and said firearm further comprising mounting means for mounting said switches in said finger grip of said handle.

4,457,092

BREECH MECHANISM FOR AUTOMATIC FIREARMS

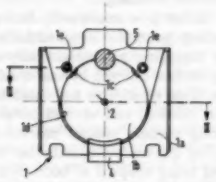
Gerhard Hupp, Oberndorf, and Helmut Mäder, Schramberg, both of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Oberndorf, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,834

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 8031454[U]

Int. Cl.³ F41C *15/00, 11/00*

U.S. Cl. 42—25 6 Claims



1. A breech mechanism for automatic weapons, said breech mechanism comprising:

(a) a breech head for an automatic weapon, said head having a recess in the breech head for receiving the impact base of a cartridge casing;

(b) a firing pin mounted for reciprocal movement in said breech head;

(c) an ejector means mounted for reciprocal movement in said breech head, the axis of reciprocation for said ejector means being parallel to the reciprocal movement of said firing pin,

(d) first and second projections formed on the periphery of said recess in said breech head, said projections being formed along an arc concentric with said firing pin and separated from one another by an angle of at least 60 degrees,

(e) an extractor claw for engaging a cartridge base and centering the cartridge base between the claw and the first and second projections;

whereby said projections and said claw cooperate both center and retain the cartridge prior to its ejection.

4,457,093

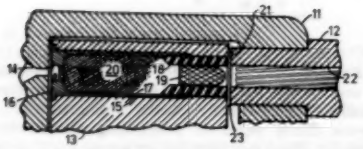
REVOLVING FIREARMS

Charles R. Olsen, 307 Conestoga Way #37, Eagleville, Pa. 19408

Division of Ser. No. 187,772, Sep. 16, 1980, Pat. No. 4,393,782. This application Feb. 17, 1983, Ser. No. 467,247

Int. Cl.³ F41C *1/00*

U.S. Cl. 42—59 3 Claims



1. A revolver firearm of the type including a frame having a barrel secured thereto through which a fired bullet is ejected, and a revolvable cylinder positioned behind the barrel, which cylinder is provided with a plurality of cartridge receiving chambers successively alignable with the barrel as the cylinder is revolved, said revolver comprising in combination,

(a) a barrel having an internal passage therethrough to permit the passage of a bullet of a first size,

(b) a cylinder having inhibiting chambers which accept a special cartridge including a case of a size which in a standard cartridge normally contains a bullet of a second size larger than a bullet of said first size, said chambers being so configured that a standard cartridge using a standard case can not be fully inserted into the cylinder chamber to thereby prevent firing of standard cartridges having bullets which can not properly pass through the barrel.

4,457,094

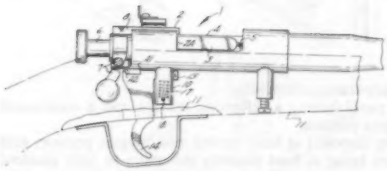
TRIGGER MECHANISM FOR A BOLT ACTION RIFLE

James G. Thompson, 4655 Butte Falls Hwy., Eagle Point, Oreg. 97524

Filed Aug. 16, 1982, Ser. No. 408,426

Int. Cl.³ F41C *19/00, 11/00*

U.S. Cl. 42—69 A 6 Claims



1. A trigger mechanism for a bolt action rifle having a bolt assembly slidably carried in a rifle receiver, the bolt assembly including a firing pin, said mechanism comprising in combination,

a trigger including a forwardly projecting trigger arm which may swing about multiple fulcrums,

a sear pivotally coupled to said trigger arm and adapted for rectilinear movement in a path normal to the firing pin of the rifle bolt assembly,

a sear housing disposed normal to the rifle bolt assembly and including resilient means biasing the trigger arm and sear to a normal raised position whereat the sear engages and restrains the firing pin of the rifle bolt assembly, said sear housing partially occupied by said trigger arm,

said trigger including first and second spaced apart fulcrums coacting with the receiver of the bolt action rifle, said first fulcrum operable during initial rearward trigger movement resulting in linear sear movement for sear disengagement from the firing pin, said second fulcrum operable during continued trigger movement to further retract the sear in a linear manner out of the path of the rifle bolt assembly to permit removal of the bolt assembly from the rifle.

4,457,095

FISHING LINE HOLDER

Richard F. Stevenson, 205 Center St., Oregon City, Oreg. 97045

Filed Oct. 19, 1981, Ser. No. 312,786

Int. Cl.³ A01K *87/02, 87/04*

U.S. Cl. 43—25.2 7 Claims

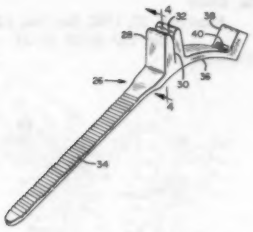
1. A fishing line holder for supporting the free end of a fishing line, a length of which extends from the tip of a fishing pole, the holder comprising:

(a) a block having a slot therein for receiving the line; and

(b) mounting means for securing the block on the pole, the mounting means comprising a ratchet strip having:

(1) a locking end;

(2) a curved portion having substantially the same radius as the pole, and mounting the block; and



(3) a flexible toothed portion for encircling the pole and engaging the locking end.

4,457,096
FISHING LURE

John J. Wasson, Alexandria, La., assignor to Smithwick Lures, Inc., Shreveport, La.

Filed Sep. 3, 1981, Ser. No. 299,111
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.42 **4 Claims**

1. A fishing lure comprising:

a hook having a point and an eye and a horizontally extending shank interconnecting the point and the eye, with the eye, point and shank lying substantially in a common vertical plane, said eye constituting the forward portion of said hook and said point being located at the rear portion of said hook when the hook is disposed in a horizontal attitude;

a pair of legs connected to the hook shank at substantially the same location therealong near said eye and diverging from each other at an acute angle with respect to each other and at locations on opposite sides of said common plane, each of said legs lying at the same acute angle with respect to said common plane as the other of said legs, said legs each extending at an obtuse angle to said hook shank and extending in a direction forwardly and away from said point, and extending to a location forward of said eye and forward of the entire hook; and

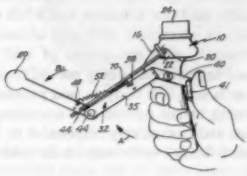
a toe connected to the end of each of said legs opposite its end connected to said shank, and angled at an obtuse angle to the axis of its respective leg in two different planes, each of said toes extending rearwardly and downwardly from the axis of its respective leg in the general direction of the point of said hook, and extending at an acute angle to the vertical when said hook shank extends horizontally, said toes lying completely ahead of said eye and on the opposite side of said eye from the point of the hook; and

a weight on each of said legs at a location between the point of connection of the respective leg to the hook shank, and the point of connection of one of said toes to the end of the respective leg opposite its end connected to the hook shank.

4,457,097
ACTION TOY AND GAME

Ronald L. Miller, Grand Rapids, Mich., and Pierce T. J. Lin, Young Ho, Taiwan, assignors to Hilco House, Inc., Grand Rapids, Mich.

Filed Oct. 28, 1982, Ser. No. 437,368
Int. Cl.³ A63H *13/02*
U.S. Cl. 446—327 **21 Claims**



1. A hand supported and hand manipulable boxing puppet toy, comprising:

a configured body support;

a handle for supporting the weight of said puppet toy, said handle depending from said body support;

an upper limb element having a first pivot point and a second pivot point, said upper limb element being pivotally carried by said body support at said first pivot point and said upper limb element extending generally forward of said body support;

an extending limb element pivotally carried on said upper limb element at said second pivot point, said extending limb having a free end displaced from said second pivot point;

said upper limb and said extending limb having an at-rest position and a striking position;

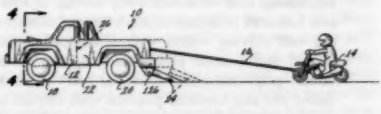
activation means for activating said upper limb and said extending limb such that said upper limb pivots about said first pivot point in a first direction of rotation and said extending limb element simultaneously pivots about said second pivot point in a second direction of rotation opposite to said first direction of rotation, so as to extend said free end of said extending limb forward of said body support from said at-rest position to said striking position; and

said activation means comprising a first lever extending from said upper limb element, said first lever extending generally rearward of said first pivot point and said first lever being disposed proximate said handle to provide an operator with the ability to grasp said handle and carry said body support in one hand and control said activation means simultaneously with the same hand.

4,457,098
VARIABLE SPEED VEHICLE WITH SATELLITE VEHICLE

Akio Tsuzuki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Japan

Filed Sep. 7, 1982, Ser. No. 415,325
Int. Cl.³ A63H *18/16*
U.S. Cl. 446—435 **9 Claims**



1. A toy which comprises:

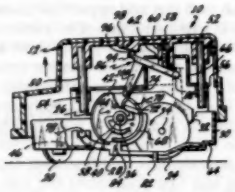
a first body;
said first body including a spring activated motor means;
said first body including a variable velocity moving means operatively associated with and receiving power from said motor means and capable of moving said first body at at least two velocities with respect to the support medium;
a second body associated with said first body;
a connecting means fixedly attached to said second body and movably associated with said first body motor means whereby movement of said second body away from said first body from a proximal position to a distal position moves said connecting means with respect to said motor means activating said motor means, and when so activated said motor means interacting with said connecting means and in response to said movement of said connecting means and said second body being moved from said distal position towards said first body to said proximal position;
velocity governing means operatively associated with said moving means and operatively responsive to the position of said second body with respect to said first body whereby
(a) after said second body has been moved from said proximal position away from said first body to said distal position, said moving means in association with said governing means moving said first body at one of said velocities;
(b) moving said first body at the second of said two velocities as a result of said 2nd body being moved from said distal to said proximal portion.

4,457,099

TOY VEHICLE HAVING BODY CAPABLE OF VERTICAL MOVEMENT WITH RESPECT TO CHASSIS

Michihiro Kozuka, and Masayuki Tonokura, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Japan

Filed May 19, 1982, Ser. No. 379,775
Claims priority, application Japan, May 22, 1981, 56-74331
Int. Cl.³ A63H *17/26*
U.S. Cl. 446—437 **10 Claims**



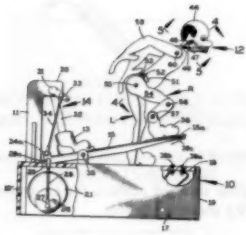
1. A toy vehicle which comprises:
a chassis, said chassis including a plurality of wheels rotatably mounted thereon, at least one of said wheels being a driving wheel;
a vehicular body movably mounted on said chassis so as to move vertically up and down relative to said chassis between a raised position and a lowered position;
a motor located on said chassis, said driving wheel operatively connected to said motor and rotated with respect to said chassis by said motor;
control means mounted on said chassis in operative association with said motor, said control means for cyclically first postioning said vehicular body in one of said raised and said lowered positions relative to said chassis and engaging said driving wheel with a support surface so as to propel said vehicle across said support surface and secondly positioning said vehicular body in the other of said raised and said lowered position with respect to said chassis and disengaging said driving wheel from said support surface so as to maintain said vehicle relatively stationary with respect to said support surface.

4,457,100

FIGURE KICKING TOY

Christopher C. Nightingale, 5220 NE. 29th Ave., Fort Lauderdale, Fla. 33308

Filed Sep. 27, 1982, Ser. No. 423,713
Int. Cl.³ A63H *33/26*
U.S. Cl. 446—333 **12 Claims**



1. In a figure kicking toy having:
a movable kicking foot operatively arranged to be extended and retracted;
a toy figure positioned to be kicked by said kicking foot when the latter is extended, said toy figure having movable visible external means thereon;
and means for extending and retracting said kicking foot including a motive power source and a linkage acting between said motive power source and said kicking foot;
the improvement which comprises:
mechanical linkage means acting between said motive power source and said movable visible external means of the toy figure to move the same in timed relation with the extension of said kicking foot;
said movable visible external means of the toy figure comrising a head of the figure mounted to be turned to the right or left and having a pivoted lower jaw,
said mechanical linkage means comprising a rotatable rod carrying said head and means for rotating said rod in timed relation with the movement of said kicking foot;
and further comprising:
a stop member mounted on the torso of the figure and operatively engaging said jaw to hold the jaw closed when the head is turned in one direction and to permit the jaw to drop open when the head is turned in the opposite direction.

4,457,101

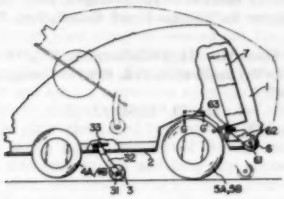
RADIO-CONTROLLED TOY CAR

Yukimitsu Matsushiro, Tokyo, Japan, assignor to Kabushiki Kaisha Matsushiro, Tokyo, Japan

Filed Jan. 31, 1983, Ser. No. 462,699
Claims priority, application Japan, Dec. 28, 1982, 57-198804[U]
Int. Cl.³ A63H *33/26, 17/36*
U.S. Cl. 446—456 **6 Claims**

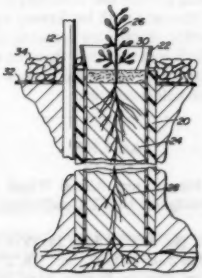
1. A radio-controlled toy car, which can run frontward or rearward in an ordinary running mode but runs only frontward in a wheelie running mode when accelerated frontward in response to radio signals transmitted from a control box, which comprises:
(a) a differential gear mechanism;
(b) a pair of drive shafts rotatably connected to said differential gear mechanism separately;
(c) a pair of rear wheels fixedly connected to said two drive shafts separately;
(d) a pair of brake mechanisms disposed near said drive shafts separately for applying a brake force to each drive shaft independently when activated; and
(e) an auxiliary rear wheel disposed backward from the position of said rear wheels at the longitudinal central axis

of the toy car in such a way as to be brought into contact with the ground only when the toy car runs in the wheelie running mode and as to change its direction freely,



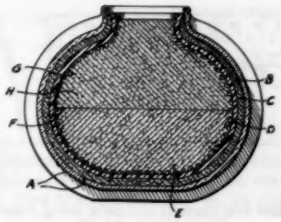
whereby the toy car can turn its running direction smoothly by the aid of said auxiliary rear wheel in the wheelie running mode when any one of said brake mechanisms is activated.

4,457,102
METHOD OF GROWING GRAPEVINES
Walter Ploeger, Jr., P.O. Box 869, Arden, N.C. 28704
Filed Sep. 27, 1982, Ser. No. 424,807
Int. Cl.³ A01C *1/00*
U.S. Cl. 47—58 **9 Claims**



1. A method of growing grapevines comprising the steps of:
(a) digging holes in the ground, inserting an open-ended tube which is impervious to water and roots and having a length of at least two feet in each hole so that the upper end of each tube is adjacent ground level, filling each tube with a sterile growing medium to a height whereby the exposed surface of the medium is below the upper end of each tube,
(b) planting a live grapevine with roots in said medium, protecting the roots from pests by covering said exposed surface of the medium around said vine with a filter which is porous to liquids but impervious to the pests and eggs of pests, and
(c) permitting the vines to grow in a controlled manner in said medium until the roots grow downwardly through said medium to the bottom end of the tubes and then spread laterally into the native soil.

4,457,103
DECORATIVE POTTERY
Victor I. Aloziem, 410 NE. 14th, Oklahoma City, Okla. 73104
Filed Sep. 9, 1981, Ser. No. 301,426
Int. Cl.³ B65D *25/14*
U.S. Cl. 47—66 **5 Claims**



1. A container that has glass as the outer layer, colored sand or salt as a middle layer and an inner layer of plaster of paris.

4,457,104
PLANT POT
Boby R. Hefner, P.O. Box 311, Coleman, Tex. 76834
Filed Jan. 4, 1980, Ser. No. 109,629
Int. Cl.³ A01G *23/02*
U.S. Cl. 47—73 **28 Claims**

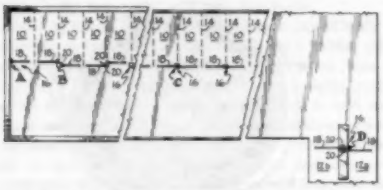
1. A pot for holding a plant or the like comprising:
a one piece container formed of plastic and comprising a bottom and side wall means extending from said bottom defining an open top end,
a narrow opening formed in said bottom in a configuration defining a tab extending from one side only of an outer portion of said bottom and which may be pushed inward into said container to remove the plant and its potting soil or the like from said container,
said plastic being characterized such that said tab may be pushed inward without breaking said tab from said outer portion.

4,457,105
BARRIER ASSEMBLY
Alex Danin, 1080 Mamaroneck Ave., White Plains, N.Y. 10605
Filed Jun. 30, 1982, Ser. No. 393,722
Int. Cl.³ E01F *13/00*
U.S. Cl. 49—49 **17 Claims**

1. In a barrier assembly for selectively preventing and allowing travel along a path including frame means situated beside said path, at least one elongated barrier arm having a blocking position projecting laterally from said frame means across said path for preventing travel past said barrier arm along said path when said barrier arm is in said blocking position, and connecting means connecting said barrier arm to said frame means for swinging movement with respect thereto about a substantially horizontal axis between said blocking position extending across said path and a non-blocking position where said barrier

arm extends substantially vertically along said frame means to be situated with the latter beside said path to permit travel there along, the improvement comprising:

said frame means comprises a first channel enclosure to which a barrier arm is connected by said connecting



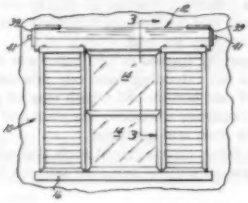
means, said first channel enclosure being constituted by a member having a substantially C-shaped cross-section, and wherein said first channel enclosure is mounted to a stanchion fixed to the ground, said stanchion comprising a second channel enclosure connected to said first channel enclosure to which said barrier arm is connected.

4,457,106

SHUTTER SYSTEM

William F. Forquer, Venice, Fla., assignor to Security Shutter Corp., Venice, Fla.

Filed Sep. 28, 1981, Ser. No. 305,929
Int. Cl.³ E06B *11/00*
U.S. Cl. 49—158 **11 Claims**



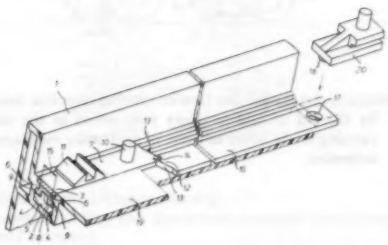
1. A shutter system for covering an opening in a wall such as a window or door, said shutter system comprising at least a pair of separate shutter units, an overhead suspension rail member having a pair of substantially parallel tracks for slidably supporting each of said shutter units from each of said tracks, means attached along a top edge of each of said shutter units in engagement with one of said tracks for independently slidably supporting each of said shutter units from one of said tracks, and abutment means proximate a vertical edge of each of said shutter units for mutual engagement causing displacement of one of said shutter units by manually displacing the other of said shutter units when said one of said shutter units is displaced from a position uncovering said wall opening to a position covering said wall opening with opposite edges of each of said shutter units overlapping each other.

4,457,107

PUSH BAR FITTING TO BE INTRODUCED INTO A LONGITUDINAL GROOVE OF THE FRAME OF A WINDOW, DOOR, OR THE LIKE

Wilhelm Frank, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to Wilhelm Frank GmbH, Fed. Rep. of Germany

Filed Mar. 11, 1982, Ser. No. 357,337
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1981, 3109107
Int. Cl.³ E05D *15/52*
U.S. Cl. 49—192 **4 Claims**



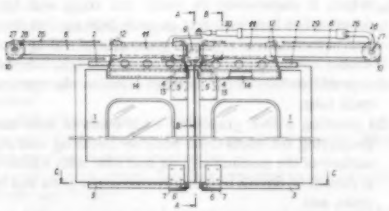
1. A push bar for the frame of a window or door having a longitudinal groove and including a rabbet surface, the frame including side walls defining the longitudinal groove and having ribs extending from the side walls toward each other, the ribs spaced from the rabbet surface, comprising, a first push bar portion mounted for displacement along the groove and resting on an upper side of the ribs, holding means connected to said first push bar portion and engaged with a lower surface of the ribs for holding said first push bar portion to the ribs, a sloping portion of the push bar connected to said first push bar portion and extending downwardly into the groove toward a bottom of the groove, and a second push bar portion connected to said sloping portion and extending in the longitudinal groove below the ribs, said push bar having at least one recess in said sloping portion thereof for reducing said sloping portion to a width which is at most less than the spacing between the ribs whereby said second push bar portion is attained in the longitudinal groove below the ribs.

4,457,108

DOOR

Konrad Kuschel, Vienna, and Alfred Wiehl, Klosterneuburg, both of Austria, assignors to IFE Gesellschaft m.b.H., Vienna, Austria

Continuation of Ser. No. 42,056, May 24, 1979, abandoned. This application Jun. 8, 1981, Ser. No. 271,182
Claims priority, application Austria, May 29, 1978, 3878/78
Int. Cl.³ E05D *15/10*; E05F *17/00*
U.S. Cl. 49—213 **23 Claims**



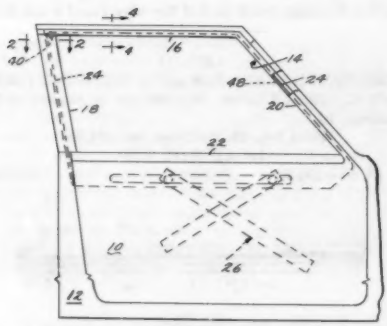
1. A slidable door, particularly for use in vehicles having a side wall, comprising at least one door section adapted to be flush with the vehicle side wall when the door section is in its

closed position; a bearing rail supported in the vehicle, said door section being arranged to slide along said bearing rail in a direction parallel to the vehicle side wall; an attachment plate connected to said door section; a plurality of pairs of guide rollers engaging said bearing rail and connected to the attachment plate and operative for permitting a longitudinal sliding of the attachment plate along the bearing rail, but preventing a relative rotating movement between the attachment plate and the bearing rail; said pairs of guide rollers being spaced from one another and having respective axles rigidly connected to said attachment plate in order to provide the slidable movement of said plate along said bearing rail; said door section comprising a pin rigidly connected thereto and extending parallel to said bearing rail and hingedly connected to the attachment plate, said bearing rail having a cross-section deviating from a circular shape; and guide means comprising slide rollers connected rigidly to said door section and guide rails engaged with said slide rollers and supported in the vehicle, said guide rails having angled sections, said slide rollers being adapted to move along said guide rails, said bearing rail being adapted to pivot so as to permit said door section to move in a direction perpendicular to the vehicle side wall when said slide rollers move along the angled sections of said guide rails.

4,457,109
FLUSH GLASS WINDOW ASSEMBLY FOR AUTOMOTIVE VEHICLE

Marion A. Royse, Fairport, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,879
Int. Cl.³ E05F *11/38*
U.S. Cl. 49—374 **4 Claims**

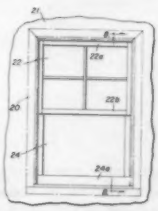


1. A flush-glass window assembly for an automotive vehicle body comprising: a window frame formed by the vehicle body, said frame including a generally horizontal top portion, two spaced-apart upright side portions and a generally horizontal belt line portion which together define a window opening; sealing means extending the length of and carried by said top portion and each of said side portions, said sealing means having sealing surfaces facing outwardly away from the interior of the vehicle body and having in addition a sealing surface facing downwardly from said top portion; a vertically movable window glass adapted to be raised and lowered in said window opening by a raising and lowering mechanism located within the vehicle body below said belt line portion; and guide means for guiding said glass during vertical movement thereof by the raising and lowering means, such that along essentially its entire path of movement the inner surface of each side edge of the glass is adjacent to and spaced outwardly from the respective outwardly facing sealing surface thereby avoiding frictional resistance to vertical movement and such that as the glass approaches its full raised position the glass moves inwardly toward the interior of the vehicle and toward and into contact with said respective outwardly facing sealing surfaces to form a compression seal therewith, the upper portion of the glass in its full up position within said window opening being substantially flush with the adjacent frame portions and the upwardly facing edge of the top of the glass forming a compression seal with said downwardly facing sealing surface.

4,457,110
WINDOW CONVERSION ASSEMBLY

James R. Beirnes, P.O. Box 2099, Joliet, Ill. 60436

Filed Mar. 11, 1982, Ser. No. 357,161
Int. Cl.³ E05D *13/00*
U.S. Cl. 49—419 **3 Claims**



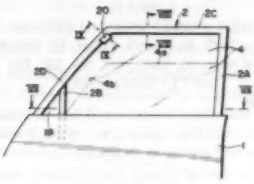
1. A kit for converting an old double-hung window assembly, including a frame having a head jamb, opposed side jambs, and a bottom sill, to a new double-hung window assembly having full perimeter weather-stripping, comprising, in combination, a headpiece for mounting against the underside of the old window frame head jamb, a sill piece for mounting against the upperside of the old window frame bottom sill, means for mounting said headpiece resiliently so as to accommodate any out-of-squareness of the old window frame, a pair of side members for resilient mounting against the respective opposed side jambs of the old window frame, a double-hung window for mounting within the assembled headpiece, sill piece, and side members to thereby form a complete window assembly, said headpiece including a vertical groove coextensive in length with the width of the upper window sash and the window including a vertical slot in its outer rail coextensive in length and generally vertically alined with the headpiece groove, first weather-stripping means disposed between the upper window sash and the assembled headpiece and including shank and tongue portions with the shank portion mounted in said headpiece groove and the torque portion extending into said window slot when the window assembly is complete, said sill piece including a vertical slot coextensive in length with the width of the lower window sash and the window including a vertical slot in its outer rail coextensive in length and generally vertically alined with the sill piece groove, and second weather-stripping means disposed between the lower window sash and the assembled sill piece and including shank and tongue portions with the shank portion mounted in said sill piece groove and the tongue portion extending into said window slot when the window assembly is complete, third weather-stripping means provided between the upper and lower window sashes, fourth weather-stripping means disposed between the window sashes and each of said side members, and said headpiece mounting means including a pair of parallel, spaced resilient plastic foam pieces interposed between the headpiece and the underside of the old window frame head jamb.

4,457,111

SEALING STRUCTURE FOR A MOVABLE WINDOW

Shoichi Koike, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 8, 1982, Ser. No. 386,426
Claims priority, application Japan, Jun. 26, 1981, 56-100093
Int. Cl.³ E05D 15/16; E06B 7/16
U.S. Cl. 49—441 4 Claims



1. A sealing structure for a movable window in an automotive vehicle having a window sill frame which includes two substantially parallel vertical sash portions, an upper, horizontal sash portion and a slanted sash portion inclined to said upper, horizontal sash portion, said upper, horizontal sash portion being at one end connected to one of said two vertical sash portions and being at the other end connected to an upper end of said slanted sash portion, the other of said two vertical sash portions being connected at an upper end thereof to said slanted sash portion, the sealing structure comprising:

(a) a pane having two parallel vertical edges, the separation of which corresponds to the separation of the vertical sash portions, an upper, horizontal edge, the configuration of which corresponds to that of the upper, horizontal sash portion, and a slanted edge, the configuration of which corresponds to that of the slanted sash portion, the pane being adapted to be moved parallel to the direction in which the vertical sash portions extend;

(b) guide means secured to the inward surface of said pane near said vertical edges and having a runner projecting beyond said vertical edges and lying in a plane parallel to said pane and offset inwardly therefrom by a given distance;

(c) vertical sealing means disposed along the vertical sash portions for engaging said runner to retain said runner in a position offset inwardly from the outward surface of the window sill frame by the given distance;

(d) horizontal sealing means disposed along the horizontal sash portion for cushioning said horizontal edge from the horizontal sash portion;

(e) slanted sealing means disposed along the slanted sash portion for cushioning said slanted edge from the slanted sash portion; and

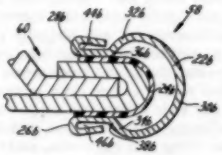
(f) vibration damper means disposed on the upper end of the slanted sash portion for receiving a corresponding portion of said slanted edge and for elastically damping vibrations thereof, said vibration damper means comprising outwardly and inwardly extending resilient flaps joining to form an inverted V-shaped member fixed to the slanted sash portion, said corresponding portion of said slanted edge being received by said inverted V-shaped member so as to be retained by said flaps.

4,457,112

EDGE GUARD

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Continuation of Ser. No. 323,513, Nov. 23, 1981, Pat. No. 4,379,377. This application Feb. 24, 1983, Ser. No. 469,481
The portion of the term of this patent subsequent to Apr. 12, 2000, has been disclaimed.
Int. Cl.³ B60J 5/00
U.S. Cl. 49—462 10 Claims



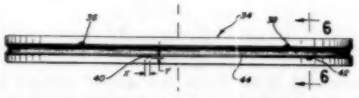
1. In an edge guard of the type comprising a metal strip formed into a generally U-shaped cross section having inner and outer legs and beads at the distal ends of the legs via which the edge guard is self-retained on the edge of an object when installed thereon, the improvement wherein the U-shaped cross section has a generally semi-circularly contoured base and includes inward offsets joining the ends of the base with each bead so that the beads are disposed in inwardly offset relation to the diametrically opposite ends of the generally semi-circularly contoured base wherein one side of the cross section is symmetric to the other side throughout the entire length of the edge guard so that the edge guard is notch-free.

4,457,113

PROTECTED SUPER-ABRASIVE GRINDING TOOL

Harold C. Miller, Chicago, Ill., assignor to Super-Cut, Inc., Chicago, Ill.

Filed Feb. 24, 1982, Ser. No. 351,965
Int. Cl.³ B24D 5/00
U.S. Cl. 51—206 R 12 Claims



1. In a rotary grinding tool comprising a generally annularly-configured super-abrasive matrix having an outer peripheral, configured working surface and a relatively-wear-prone, concentrically-disposed support structure therefor with continuous radial marginal portions laterally abutting and supporting marginal side portions of the super-abrasive matrix continuously around the periphery thereof, the improvement wherein said support structure has at least one peripherally-exposed recess in said continuous radial marginal portions contiguous with said super-abrasive matrix and having imbedded in said recess a peripherally-exposed super-abrasive medium.

4,457,114

WORKPIECE CARRIER

Douglas J. Hennenfent, New Hope; Allan L. Holmstrand, Bloomington, and Alan G. Kracke, Minnetonka, all of Minn., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Sep. 30, 1982, Ser. No. 430,195
Int. Cl.³ B24B 41/06
U.S. Cl. 51—216 R 11 Claims

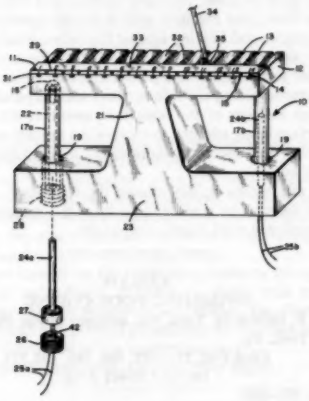
1. An article for supporting an elongate workpiece having

first and second elongate, flat, substantially parallel surfaces, said workpiece to be attached to the article by bonding the first surface of the workpiece to a support surface on the article and for bending the workpiece to create a concave shape in its second surface responsive to power input comprising;

(a) a relatively rigid base;

(b) a stem having first and second ends and attached at its first end approximately perpendicular to the base;

(c) a support bar attached to the second end of the stem and cantilevered therefrom approximately parallel to and opposing the base, said support bar being relatively flexible respective to the base's and stem's stiffness, and said



support bar having a support surface facing away from the base and conforming approximately to the shape of the workpiece's first surface, and having a load point facing the base on the cantilevered end of the support bar;

(d) a column attached to the base and spaced apart from the stem, and extending toward and contacting the load point on the support bar, each said column having a positive thermal coefficient of expansion;

(e) heat generating means in intimate thermal contact with the column, and receiving the energy input and generating heat therefrom, for heating the column and causing it to expand, thereby applying force to the load points and bending the support bar.

4,457,115

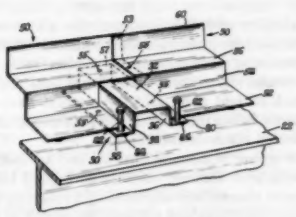
BUILDING DECK STRUCTURE

Kenneth R. Grearson, Park Ridge, and Robert Watson, Jr., Woodstock, both of Ill., assignors to Multuloc Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 107,033, Dec. 26, 1979, Pat. No. 4,285,173. This application Jul. 27, 1981, Ser. No. 286,882

Int. Cl.³ E04C *2/26*

U.S. Cl. 52—73 **51 Claims**



1. In a poured concrete building deck structure extending to the external building line or to a designated line of an internal opening wherein the deck structure has a form deck supported by structural girders with edge girders which are spaced from said building line or said designated line, an improved edge construction comprising:

said form deck terminating at said edge girders;

a plurality of spaced support means secured to the top of said edge girders and extending in cantilevered fashion beyond said edge girders towards said building line or said designated line; and

a plurality of adjacent pans comprising a substantially horizontal sheet substantially filling the space between said edge girders and a predetermined distance from or at said building line or said designated line and an upstanding substantial vertical sheet capable of retaining said poured concrete and supported by at least two of said support means, said pans being in communication with and secured against movement with respect to one of said edge girders and extending beyond said edge girder toward said building line or said designated line.

4,457,116

SPACE MODULE

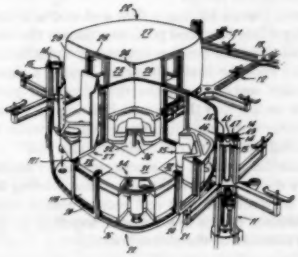
Ernest J. Kump, 56 Curzon St., Mayfair, London, W1Y 7PF, England

Filed Jun. 12, 1980, Ser. No. 272,455

The portion of the term of this patent subsequent to Jun. 9, 1998, has been disclaimed.

Int. Cl.³ E04B *1/348*; E04F *17/08*

U.S. Cl. 52—221 **6 Claims**



1. A space module having in combination a single inlet connection for a plurality of utilities, a utility manifold means extending from the inlet connection to a plurality of locations in the module, connecting means at each of the locations for a plurality of the utilities carried in said manifold and modular furniture units having readily releasable coupling means for connection to the plurality of utilities at each said location by said coupling means.

4,457,117

MODULAR ROOM DIVIDER SYSTEM

Alfred J. Leiber, Hacienda Heights; Daniel Schmid, Long Beach, and Myrl D. Pierce, Downey, all of Calif., assignors to Benedetti Corporation, Los Angeles, Calif.

Filed May 14, 1982, Ser. No. 378,073

Int. Cl.³ F04H *1/00*; F16B *13/00*

U.S. Cl. 52—238.1 **14 Claims**

1. A modular room divider system comprising:

first upright panel means for separating an interior space;

second upright panel means for separating an interior space; and

coupling assembly means for removably joining the first upright panel means to the second upright panel means, the coupling assembly comprising

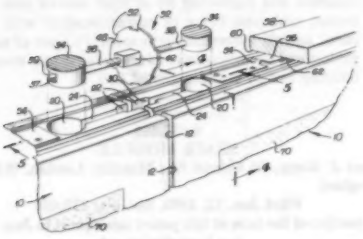
first and second anchor means for removably engaging the first and second panel means respectively, the first anchor

means engaged by the first panel means and the second anchor means engaged by the second panel means;

first and second threaded bolt means for providing an axial coupling to the panel means, the first bolt means laterally joined to the first anchor means and the second bolt means laterally joined to the second anchor means;

elongated threaded sleeve means for axially coupling the first and second bolt means and causing opposing axial movement of the first and second bolt means upon rotation of the threaded sleeve means, the first and second bolt means threadably engaging the sleeve means;

means for rotating the sleeve means to thereby cause opposing motion of the first and second anchor means, whereby a rotation of the sleeve means in one direction causes a joinder of the first and second panel means and a rotation



opposite the one direction causes a separation of the panel means; and in which

the sleeve means having a first end and a second end and having a first threaded portion adjacent the first end and a second threaded portion oppositely threaded adjacent the second end, the first bolt means having a thread in a first direction mating with the first threaded portion of the sleeve means and the second bolt means having a thread opposite the first direction mating with the second threaded portion of the sleeve means; and

the means for rotating the sleeve means is slidable along the sleeve means to allow the means for rotating the sleeve to slide between the first and second panels when the first and second panels are brought together in juxtaposition upon rotation of the sleeve means.

4,457,118

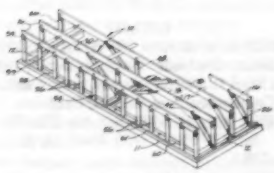
INTEGRAL FOUNDATION AND FLOOR FRAME SYSTEM AND METHOD OF BUILDING CONSTRUCTION

Alfred J. Bowen, 3214 Fairway Dr., Coeur d'Alene, Id. 83814

Filed Aug. 14, 1981, Ser. No. 292,893

Int. Cl.³ F02D *27/00*

U.S. Cl. 52—292 **31 Claims**



1. An integral floor and foundation wall frame component for use in a framed building structure having (a) a peripheral all weather treated wooden foundation resting on a below grade footing sill plate for supporting the framed building structure, (b) said peripheral treated wooden foundation including an external covering of all weather treated wooden sheathing abutting subgrade backfill material externally banked against the foundation, and (c) flooring supported by the all weather treated wooden foundation, said frame component comprising:

an elongated floor joist member of rectangular cross section having (a) a longitudinal length dimension between opposed ends, (b) a transverse width dimension between longitudinal side surfaces, and (c) a depth dimension between opposed top and bottom edge surfaces joining the side surfaces with the top edge surface adapted to receive the floor;

a wooden all weather treated foundation bearing wall stud having (a) a top end with a first surface engaging the bottom surface of the floor joist member for supporting the joist member, (b) a free bottom end extending below the floor joist member with a second bearing surface for engaging and bearing against the below grade footing sill, (c) side surfaces coplanar with the side surfaces of the floor joist member and (d) parallel outside and inside edge surfaces joining the side surfaces and perpendicular to the edge surfaces of the floor joist member, the inside edge surface being adapted to receive the treated wooden foundation wall sheathing thereon and support subgrade backfill; and

truss clip means rigidly joining the floor joist member and the foundation wall stud to form the integral floor and foundation wall frame component.

4,457,119

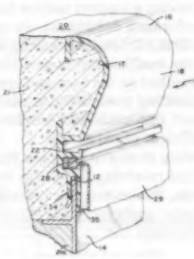
SWIMMING POOL COPING

Donald E. Dahowski, York, Pa., assignor to Fox Pool Corporation, York, Pa.

Filed Feb. 17, 1981, Ser. No. 235,224

Int. Cl.³ E04H *3/16*

U.S. Cl. 52—300 **12 Claims**



1. A swimming pool coping for use on a swimming pool, wherein said swimming pool includes a vertical pool wall and a horizontal deck, said coping comprising a unitary member having the following integral parts:

A. a bifurcated body member defining a downward facing groove which is adapted to be positioned around the periphery of a swimming pool and to receive the top of the swimming pool wall within said groove,

B. A rounded contoured top portion formed as an integral extension and disposed vertically above said body member, said top portion, upon installation of the coping on the swimming pool comprising a transitional corner element between the vertical wall of said pool and the horizontal deck of said pool, said top portion having a horizontal cavity facing the deck of said pool and arranged to receive poured concrete therein, and

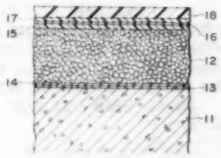
C. an upper horizontal channel and an independent lower horizontal channel opening to a pool interior, the said lower channel accommodating a retaining bead of a swimming pool liner and wherein the mouth of the lower horizontal channel falls in a vertical plane which is substantially contiguous to the vertical pool wall on which said coping is installed.

4,457,120

FLOOR PAVEMENT STRUCTURE

Fumio Takata, Kobe, Japan, assignor to Sumitomo Gomu Kogyo Kabushiki Kaisha, Kobe, Japan

Filed Mar. 30, 1982, Ser. No. 363,467
Claims priority, application Japan, Mar. 31, 1981, 56-48729
Int. Cl.³ B32B 3/18; E04C 1/00
U.S. Cl. 52—309.4 11 Claims



1. A floor pavement structure comprising a base material formed of concrete or asphalt or the like;

a cushioning layer laminated over the base material and comprised of a mixture of a multiplicity of elastic particles bonded together with a binder so as to leave fine air voids between the elastic particles to assist in imparting a desired elasticity to the cushioning layer;

a filler layer formed on the cushioning layer by the application of an unhardened, foaming synthetic resin material containing therein numerous air bubbles, the filler layer being effective to prevent permeation of the resin material into the fine voids of the cushioning layer;

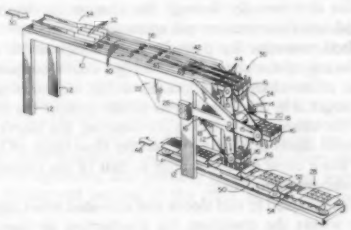
and an overcoat laminated over the filler layer.

4,457,121

CONTINUOUS MOTION BOTTLE PACKER

Lloyd D. Johnson, Portland, and John L. Raudat, North Madison, both of Conn., assignors to Standard-Knapp, Inc., Portland, Conn.

Filed Sep. 27, 1982, Ser. No. 425,104
Int. Cl.³ B65B 35/46, 35/54, 57/14
U.S. Cl. 53—56 26 Claims



1. A packer for depositing groups of articles in upwardly open packing cases and comprising:

conveyor means for advancing articles continuously in side-by-side columns along a first horizontal path so that these articles are arranged in end-to-end relationship and in predetermined groups corresponding to the capacity of the cases,

means defining an infeed station at the downstream end of said conveyor means and including fixed cantilever mounted fingers for slidably receiving said columns of articles, said fingers being spaced laterally to define horizontally extending openings therebetween,

a plurality of grid structures, each grid structure defining individual upwardly open article receiving pockets, said pocket defining grid structure including upwardly projecting pocket corner posts and support rails to which said posts are mounted in longitudinally spaced relationship, each grid structure including article support means movably mounted for supporting articles in said pockets in one position and for releasing articles in a second position for said article support means,

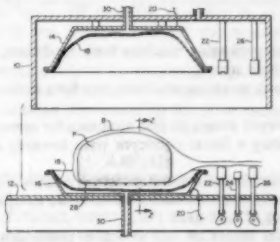
means for moving said grid structures continuously in a closed orbital path such that said posts move in a vertical plane and through the horizontal extending openings defined by said spaced fingers at said infeed station, said orbital path having a horizontal component of velocity at said infeed station which component is closely matched to the horizontal speed of the articles at least as said posts move upwardly through said horizontally extending openings said orbital path for said grid structures including a discharge station spaced from said infeed station, and means for moving said article support means from support to release position at said discharge station.

4,457,122

VACUUM PACKAGING GOODS IN HEAT SHRINKABLE PLASTIC BAGS USING FLEXIBLE DIAPHRAGMS

J. Harel! Atkins, Duncan, and Joseph E. Owensby, Spartanburg, both of S.C., assignors to W. R. Grace & Co., Cryovac Div., Conn.

Filed Aug. 21, 1981, Ser. No. 295,155
Int. Cl.³ B65B 31/02
U.S. Cl. 53—434 15 Claims



1. A method of vacuum packing goods pre-loaded into a heat shrinkable bag and heat shrinking the bag comprising the steps of (a) providing flexible diaphragm means which can be heated and which are operatively co-operable with said bagged goods, said diaphragm means being adapted to deliver heat to said bag; (b) providing platen means substantially surrounding but defining a space larger than the bagged goods, said platen means including means to heat said diaphragm means; (c) heating said diaphragm out of contact with said bag by bringing said diaphragm means into contact with said platen means; (d) evacuating the air from inside said bag; (e) collapsing said heated diaphragm into contact with the bag to heat and to shrink the bag onto said goods; (f) and, closing and sealing the evacuated bag.

4,457,123

METHOD AND APPARATUS FOR DEPACKING ARTICLES

John W. Hoehn, 7 Webb St., Middle Brighton, Victoria, Australia

Filed Dec. 10, 1981, Ser. No. 329,312
Claims priority, application Australia, Dec. 11, 1980, PE6898
Int. Cl.³ B65B 43/38
U.S. Cl. 53—492 10 Claims

1. A method of removing articles from a package comprising a plurality of articles in a number of parallel rows to provide a rectangular formation, said articles being encased in an envelope of flexible thermoplastic film, said method comprising positioning the package with the rows of articles supported on a horizontal base, severing the flexible thermoplastic film of

said package along a plane passing between adjacent rows of said articles to thereby cut the film into two sections, gripping each said film section by separate opposed film removal means, and each said film removal means acting to draw a respective one of said film sections from the formation of articles in a direction normal to said plane while said removal means engages with said articles supported on said horizontal base to maintain said articles in said formation.

4,457,124

BAG-PACKAGING MACHINE FOR BREAD

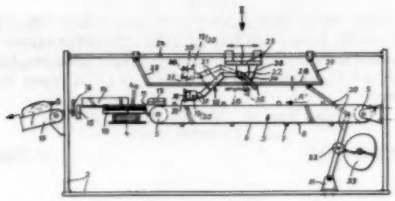
Johannes Hartmann, 40, Lange Strasse, D-4795 Delbrück, Fed. Rep. of Germany

Filed Sep. 3, 1981, Ser. No. 299,250

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129205

Int. Cl.³ B65B *31/06*

U.S. Cl. 53—512 **8 Claims**



1. In a bag packaging machine for a food item, having:
(a) a machine structure
(b) a support means on said structure for a stack of unopened bags
(c) a conveyor means on said structure for conveying a food item along a linear conveyor path towards said support means
(d) a suction device on said structure positioned adjacent to said stack support means and operable to open an uppermost bag of said stack
(e) spreader means on said structure positioned adjacent to said stack support means and including at least one spreader to enter an opened bag and retain the bag in opened condition
(f) pusher means carried movably on said structure and movable along said conveyor path to contact a food item thereon and push it into an opened bag, said pusher means including a suction head positioned to enter the bag, said pusher means being pivotable into and out of said conveyor path,
(g) bag sealing means on said structure for sealing a bag containing a food item,
the improvement which comprises, in combination,
(i) said conveyor means is an endless conveyor belt terminating at a downstream end adjacent said stack support means,
(ii) said spreader means comprises two spreader arms pivotable towards and away from each other in a direction transverse to said conveyor path
(iii) said pusher means is pivotable vertically into and out of said conveyor path about a horizontal axis transverse to said conveyor path, said pusher means being also translatable parallel to said conveyor path, said pusher means being arranged to pivot from a starting point downwardly to a position at the rear of a food item on said conveyor path, thereafter to move along said path to push the food item into an opened bag, thereafter to push the bagged food item along said conveyor path beyond said spreaders to said sealing means, thereafter to return along said conveyor path, thereafter to pivot upwardly out of said conveyor path, and thereafter to return further along parallel to said conveyor path to said starting point, and said suction head being operable to apply suction when said bagged food item has passed beyond said spreaders and to terminate said suction when said bagged food item has been sealed by said sealing means.

4,457,125

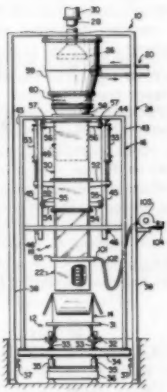
PRESS FOR PACKING COMPRESSIBLE MATERIAL HAVING AN AIR RELEASE SLEEVE

Francis B. Fishburne, P.O. Box 706, Arden, N.C. 28704

Filed Apr. 22, 1983, Ser. No. 487,732

Int. Cl.³ B65B *1/24, 1/28*

U.S. Cl. 53—527 **24 Claims**



1. In a press for packing loose, compressible material into a container, the press including an upright hollow charger positioned above the container and movable between upper and lower positions, a pressing ram having a press head and being movable downwardly through the charger to compress the material into the container and upwardly to withdraw the ram, an infeed conveyor for delivering the compressible material into the top of the charger, and a rigid sleeve coupled to the bottom of the charger and located within the container when the charger is in the lower position and without the container when the charger is in the upper position, the sleeve having transverse dimensions slightly smaller than those of the container but a cross section similar to that of the container, the improvement comprising:
means, coupled to said sleeve and activated when said sleeve is within the container, for conducting air transversely from inside said sleeve, upwardly longitudinally of said sleeve but not in contact with the sides of the container, and then outwardly away from said sleeve above the sides of the container,
said means for conducting air comprising
at least one perforation passing transversely through said sleeve and in air flow communication with the interior and exterior of said sleeve,
means, in air flow communication with said at least one perforation and extending longitudinally of said sleeve, for defining an air conducting channel with the exterior of said sleeve, and
rigid reinforcement means, engaging the exterior of said sleeve and said means for defining an air conducting channel, for maintaining a space therebetween under the forces of compaction.

4,457,126
PAPER SHEET BUNDLING APPARATUS

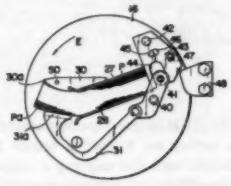
Yoshiro Hasbimoto, and Shigeo Horino, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Division of Ser. No. 414,313, Sep. 2, 1982, Pat. No. 4,412,411, which is a continuation of Ser. No. 133,940, Mar. 25, 1980, abandoned. This application Jul. 21, 1983, Ser. No. 515,813

Claims priority, application Japan, Mar. 28, 1979, 54-36730; Mar. 28, 1979, 54-36731; Mar. 28, 1979, 54-36732; Mar. 29, 1979, 54-37508; Mar. 29, 1979, 54-37509; Mar. 29, 1979, 54-37510; Mar. 29, 1979, 54-41038[U]

Int. Cl.³ B65B *27/08, 63/02*

U.S. Cl. 53—528 2 Claims



1. A paper sheet bundling apparatus for a paper sheet processing system in which stacked paper sheets are bundled in a bundling position with a bundling tape, comprising:

a stationary frame;

a rotary body supported within said frame and rotatable about an axis from a normal position;

locating means provided within said rotary body and serving to locate the paper sheet stack in the bundling position;

paper sheet stack feed-in means disposed on one side of said rotary body and serving to feed the paper sheet stack into said locating means;

bundled paper sheet stack feed-out means disposed on the side of said rotary body diametrically opposite said paper sheet stack feed-in means and serving to receive the bundled paper sheet stack from said locating means after the end of the operation of bundling the paper sheet stack;

clamp means for engaging and holding a major portion of the paper sheet stack so that said stack is clamped in position during the bundling operation;

means for moving said clamp means between a clamp position and a clear position;

a pressing member movably disposed on one side of and at the unclamped portion of the paper sheet stack in the bundling position and being operative to engage and bend the unclamped portion of the paper sheet stack;

a block member disposed on the side of said paper sheet stack opposite from said one side and having an outwardly curved contact surface for engagement with the paper sheet stack when bent by said pressing member; and

means for operating said pressing means to press and bend the unclamped portion of the stack against said contact surface.

4,457,127
MOWER

Martin Maier, Gottmadingen, and Hermann Ruprecht, Singen, both of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG, Gottmadingen, Fed. Rep. of Germany

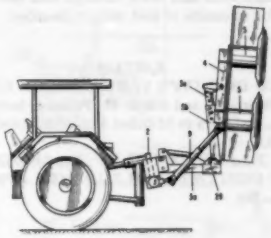
Filed Aug. 13, 1982, Ser. No. 408,019

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1981, 3134391

Int. Cl.³ A01D *55/18*

U.S. Cl. 56—192 3 Claims

1. A mower comprising in combination, a mower supporting mount beam carrying at least one mowing device on its underside, a carrying beam having at least two parts, namely an inner carrying beam part and outer carrying beam part in an outer position, a hitching mount for hitching the mower to a transport device, such as a tractor, drive means disposed along the carrying beam coupling the transport device to drive the mowing device, pivot means for swinging the mower between a position behind the transport device and a working position perpendicular thereto coupling the carrying beam about a vertical pivot axis disposed approximately centrally on the hitching mount, means pivoting one carrying beam part and the drive means about a horizontal pivot axis approximately at the center of the carrying beam to move the outer beam part upwardly into an upward position, means mounting the mower



supporting beam on the outer carrying beam part to move with its accompanying mower upwardly with the outer carrying beam part about said horizontal axis, and a hydraulic cylinder having a movable piston and connected with the outer part of the carrying beam and mounted to effect its pivot into the upper position for transport behind the transport position when the vertical pivot means for swinging the mower is pivoted to swing it behind the mower and upwardly thereby to produce a center of gravity for the mower close to the transport device without disconnecting the drive means.

4,457,128
NEEDLE DEVICE FOR SPLICING

Lars Brunvoll, ovre Fredlundveg 37, N-5032 Minde, Norway

PCT No. PCT/NO82/00003, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/02729, PCT Pub. Date Aug. 19, 1982

PCT Filed Feb. 4, 1982, Ser. No. 432,924

Claims priority, application Norway, Feb. 6, 1981, 810405

Int. Cl.³ D07B *7/18;* B65H *69/06*

U.S. Cl. 57—23 8 Claims

1. A unitary needle device for finishing and splicing lines or cordage, consisting essentially of:

a unitary member of substantially cylindrical configuration;

said unitary member having a tapered front end portion, a tubular middle portion having a substantially continuous circumference and adapted to receive a strand end, and a substantially tubular rear portion;

said rear portion comprising an elongated lateral opening adapted for insertion of said strand and an integral hook internal of said rear portion opposite said lateral opening;

said hook extending from a base portion thereof located adjacent the rear end of said unitary member obliquely toward said lateral opening and toward said middle portion of said unitary member,

said hook comprising a tip portion positioned generally opposite the rear-most part of said middle portion of said unitary member and spaced therefrom a distance sufficient to permit insertion of said strand into said middle portion, whereby said strand is insertable axially thereof into said middle portion through said lateral opening and laterally engageable with said hook through said lateral opening for retention in said unitary member.

4,457,129

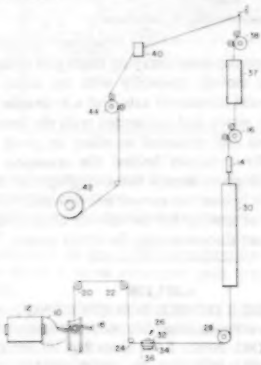
SLOTTED DISC TYPE YARN TENSION CONTROL

William J. Schroder, and Edgar H. Pittman, both of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 18, 1982, Ser. No. 435,052

Int. Cl.³ D02G *1/02*; D01H *7/18*; B65H *49/00, 57/22*

U.S. Cl. 57—284 **6 Claims**



1. Apparatus to produce a yarn having areas of differential bulk throughout its length comprising: a texturing device, supply means supplying continuous filament, synthetic yarn to said texturing device, a heater means located between said texturing device and said supply means to heat the yarn passing to said texturing device, means taking up yarn from said texturing device and a disc tension device mounted between said supply means and said heater means to vary the supply of yarn to said heater means, said disc tension including an electromagnet, a post member operably associated with said electromagnet, a first metallic disc member mounted on said post, a second metallic disc member mounted on said post adjacent said first disc member and means forming a yarn path in said post between discs which is offset from the centerline of said post.

4,457,130

AIR SPINNING NOZZLE UNIT

Shoji Sakai; Michiaki Fujiwara; Nobunori Kubota; Koshi Noda, all of Kyoto, and Toshifumi Morihashi, Shiga, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 28, 1981, Ser. No. 335,221

Claims priority, application Japan, Oct. 13, 1981, 56-152717[U]; Oct. 13, 1981, 56-152718[U]

Int. Cl.³ D01H *1/13*

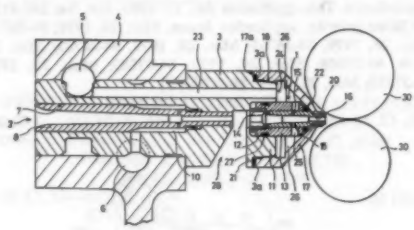
U.S. Cl. 57—328 **49 Claims**

1. An air spinning nozzle unit internally provided with a nozzle proper, characterized in that:

said nozzle proper is set on the front end of a nozzle housing;

a cap is fitted onto the front end of said nozzle housing so as to air-tightly cover said front end and said nozzle proper;

an air guiding path is provided to communicate externally with an air-tight gap formed between said cap and said front end of the nozzle housing; and



said air-tight gap is adapted to communicate with at least one port for jetting air toward a nozzle hole bored in the nozzle proper such that said gap is utilized as a tank acting as an accumulator for externally supplied, pressurized air to be jetted.

4,457,131

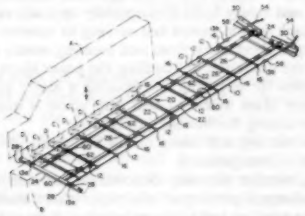
ASSEMBLY METHOD FOR CABLE-TYPE TIRE CHAINS AND THE LIKE

James W. Coutts, Swanton, Vt., assignor to Burns Bros., Inc., Portland, Oreg.

Division of Ser. No. 259,892, May 1, 1981, Pat. No. 4,396,184. This application Apr. 4, 1983, Ser. No. 481,884

Int. Cl.³ B21L *3/00*

U.S. Cl. 59—35.1 **1 Claim**



1. In the manufacture of a cable-type tire chain and the like, a method of assembling a plurality of flexible cable cross members to a pair of elongate flexible cable side members by means of hooks attached to the opposite ends of each cross member, said method comprising supporting the side members spaced apart and positioning the cross members spaced apart in succession between the side members transversely thereto, the positioning of the cross members comprising placing each cross member in only a single trough extending transversely of the side members in the space therebetween and with each end of each trough adjacent to and spaced from a corresponding side member, engaging a hook at each end of each cross member with a corresponding side member so that the hooks embrace the corresponding side members, applying tension to the side members, applying sufficient tension to the cross members to retain the hooks embraced with the corresponding side members, the applying of tension to the cross members comprising positioning rod means between the side members with opposite ends of the rod means engaging the respective side members and urging them apart, and closing the hooks upon the corresponding side members by pressing operations, said pressing operations being conducted so that plural hooks embracing one side member are closed simultaneously and plural

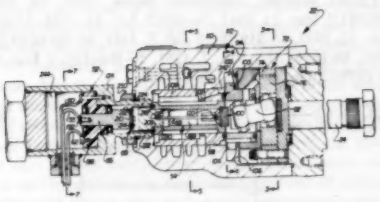
hooks embracing the remaining side member are closed simultaneously, the hooks being open until said pressing operations.

4,457,132

CONTROL APPARATUS

Maurice P. Roberts, Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 5, 1981, Ser. No. 318,345
Int. Cl.³ B62D 5/06; F01C 1/02
U.S. Cl. 60—384 **46 Claims**



1. An apparatus for controlling a flow of fluid from a pump to a fluid motor assembly that is operable to turn steerable vehicle wheels, said apparatus comprising

a housing adapted to be connected in fluid communication with the pump and the motor assembly,

a gerotor gear set disposed in said housing and including relatively movable internally and externally toothed members,

a valve member disposed in said housing and connected with one of said toothed members for movement relative to said housing under the influence of forces transmitted from said one toothed member to said valve member, said valve member being movable from an initial position to a first actuated position to port fluid from the pump to the motor assembly to effect operation of the motor assembly to turn the vehicle wheels in a first direction, said valve member being movable from the initial position to a second actuated position to port fluid from the pump to the motor assembly to effect operation of the motor assembly to turn the vehicle wheels in a second direction, and

switch means for effecting a control function in response to movement of said valve member from the initial position, said switch means including a switch actuator connected to said valve member for movement therewith under the influence of forces transmitted from said valve member to said switch actuator upon movement of said one of said toothed members relative to said housing.

4,457,133

METHOD OF GOVERNING THE WORKING GAS TEMPERATURE OF A SOLAR HEATED HOT GAS ENGINE

Sten-Håkan Almström, Lund, and Hans G. Nelving, Höllviksnäs, both of Sweden, assignors to United Stirling AB, Malmo, Sweden

Filed Jul. 29, 1981, Ser. No. 287,873
Int. Cl.³ F02G 1/06
U.S. Cl. 60—524 **7 Claims**

1. A method of governing the operation of a solar heated, closed cycle, hot gas engine comprising:

(a) measuring the working gas temperature;

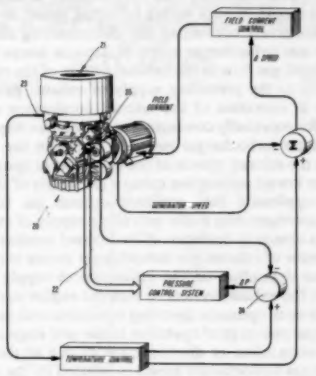
(b) comparing said measured working gas temperature to a predetermined optimum working gas temperature for achieving maximum engine efficiency;

(c) measuring the working gas pressure;

(d) comparing said measured working gas pressure with a predetermined engine idle pressure and with a predetermined engine maximum allowable working gas pressure;

(e) for engine operation below the engine power output range, maintaining the working gas pressure essentially constant and equal to the predetermined idle pressure while the working gas temperature is allowed to increase to the predetermined optimum working gas temperature; and

(f) for engine operation in at least one part of the engine power output range, maintaining the working gas temperature essentially constant and equal to the predetermined



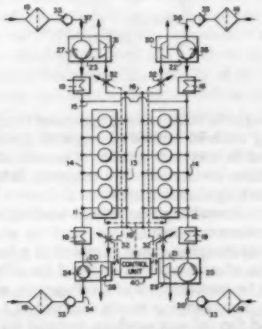
optimum working gas temperature by varying the working gas pressure, said temperature maintaining step also including the sub-step of holding the engine speed essentially constant during said output power range part, and said temperature maintaining step also including the sub-step of limiting any increase in working gas pressure to a pressure about equal to the maximum allowable working gas pressure.

4,457,134

TURBOCHARGE SYSTEM FOR INTERNAL COMBUSTION ENGINES

Herbert Deutschmann, Friedrichshafen, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Aug. 4, 1981, Ser. No. 289,988
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030265
Int. Cl.³ F02B 37/00
U.S. Cl. 60—612 **7 Claims**



1. An internal combustion engine having an intake and exhaust system and producing exhaust gases flowing through the exhaust system comprising a plurality of exhaust gas turbocharger means operatively connected in parallel in said intake and exhaust system and constructed so that together all of the

turbocharger means are operable to accommodate an exhaust gas and air mass throughflow of the engine at rated power of the engine, said exhaust gas tubocharger means including a relatively smaller exhaust gas turbocharger means and relatively larger remaining exhaust gas turbocharger means, said relatively smaller exhaust gas turbocharger means being smaller than the relatively larger remaining exhaust gas turbocharger means and being operable to accommodate a smaller exhaust gas throughflow than the remaining exhaust gas turbocharger means, control means including means for selectively and successively connecting and disconnecting the remaining exhaust gas turbocharger means in stepwise jumps to and from the exhaust gas flow in the exhaust system of the engine corresponding to the prevailing supply of exhaust gases during a change in operation of the internal combustion engine, and means for repeatedly connecting and disconnecting the smaller exhaust gas turbocharger means to and from the exhaust gas flow in the exhaust system of the engine in an operating range between lowest and highest exhaust gas supply of the engine so as to supplement the remaining exhaust gas turbocharger means corresponding to the prevailing supply of exhaust gases during a change in operation of the internal combustion engine, the number of exhaust gas turbocharger means in operation at any time depending on the instantaneous supply of exhaust gases in the exhaust system so that the engine operates maximally close to optimum operating conditions and each stepwise jump from one stage of operation to the next stage of operation by the connection or disconnection of one of the remaining exhaust gas turbocharger means is reduced by the intervening connection and disconnection of the smaller exhaust gas turbocharger means.

4,457,135

MAGNETIC REFRIGERATING APPARATUS

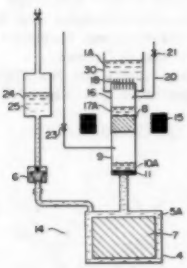
Yoshinori Hakuraku; Hisanao Ogata, and Takahiro Daikoku, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1983, Ser. No. 485,398

Claims priority, application Japan, Apr. 23, 1982, 57-67277

Int. Cl.³ F25B *21/02*

U.S. Cl. 62—3 **6 Claims**



1. In a magnetic refrigerating apparatus comprising:
a working material formed of magnetic material;
a magnetic field system capable of periodically varying the distribution or intensity of a magnetic field impressed on said working material; and
means for transmitting heat to said working material;
the improvement comprising:
first heat exchanging means disposed at a low temperature end face of said working material for effecting heat exchange by condensation of a refrigerant; and
second heat exchanging means disposed at a high temperature end face of said working material for effecting heat exchange by boiling of another refrigerant;
wherein heat exchange is effected by the condensation heat transfer through said first-mentioned refrigerant in a process in which the working material absorbs heat and by the boiling heat transfer through said last-mentioned refrigerant in a process in which the working material release heat.

4,457,136

METAL HYDRIDE REACTOR

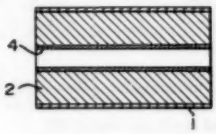
Tomoyoshi Nishizaki, Suita; Minoru Miyamoto, Kusatsu; Kazuaki Miyamoto, Amagasaki; Ken Yoshida, Ibaraki; Kathuhiko Yamaji, and Yasushi Nakata, both of Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 16, 1982, Ser. No. 358,797

Claims priority, application Japan, Mar. 23, 1981, 56-40879[U]; Mar. 23, 1981, 56-42667; Jun. 22, 1981, 56-91928[U]; Jun. 22, 1981, 56-91929[U]; Jul. 7, 1981, 56-101611[U]; Jul. 7, 1981, 56-101612[U]; Jul. 7, 1981, 56-101613[U]; Dec. 8, 1981, 56-197937; Dec. 8, 1981, 56-197938

Int. Cl.³ F17C *11/00*

U.S. Cl. 62—48 **22 Claims**



1. A metal hydride reactor comprising:
a tubular pressure receptacle having an opening at one end thereof and containing a metal hydride therein, at least a part of the outer wall surface of said tubular pressure receptacle forming a heat-exchanging surface;
means, including at least on heat-conducting fin formed of a heat-conducting material within said receptacle, for transmitting heat from the metal hydride in said receptacle through said at least one fin to said heat-exchanging surface, and for limiting the location of the metal hydride in said pressure receptacle; and
at least one axially elongated elastically deformable, plastic porous member extending axially of said receptacle so as to form within said receptacle a hydrogen gas flow passage leading to said opening of said receptacle, said porous member being permeable to hydrogen gas and impermeable to the metal hydride.

4,457,137

AIRCONDITIONER WITH TIMER CONTROLLED COMPRESSOR BYPASS

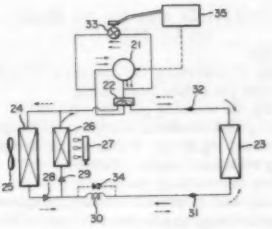
Chikashi Kohzuma, Shizuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1982, Ser. No. 370,549

Claims priority, application Japan, Apr. 23, 1981, 56-61630

Int. Cl.³ G05D *23/32*; F25B *13/00*

U.S. Cl. 62—158 **6 Claims**



1. A heat pump type airconditioner comprising: refrigerant

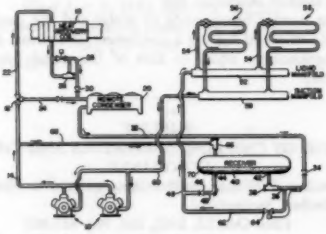
compression means; a first heat exchanger disposed indoors and which functions as an evaporator during a cooling mode of operation and as a condenser during a warming mode of operation; a second heat exchanger disposed outdoors and which functions as a condenser during the cooling mode of operation; a third heat exchanger for heating the refrigerant during the warming mode of operation to increase the temperature thereof to a temperature higher than the outdoor air; heating means operatively associated with said third heat exchanger for providing heat to the third heat exchanger; said compression means and heat exchangers being connected in a refrigeration circuit for operating in the cooling mode and the warming mode when refrigerant is circulated therethrough in the proper direction, said refrigeration circuit having sufficient refrigerant therein for the second heat exchanger to be filled with liquid refrigerant when the airconditioner is operating in the warming mode and said third heat exchanger is being supplied with heat from said heating means; a compression means bypass pipe connected between the higher pressure side and the lower pressure side of said compression means; valve means connected in said bypass pipe for controlling the flow of refrigerant through said bypass pipe; and control means connected to said valve means for closing said valve means during normal cooling mode operation and having timing means as a part thereof for keeping said valve means open for a fixed predetermined length of time at the start of said compression means during the cooling mode of operation for keeping said bypass pipe open for said predetermined length of time.

4,457,138

REFRIGERATION SYSTEM WITH RECEIVER BYPASS

Edward E. Bowman, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Filed Jan. 29, 1982, Ser. No. 343,931
Int. Cl.³ F25B *39/04*
U.S. Cl. 62—196.1 **22 Claims**



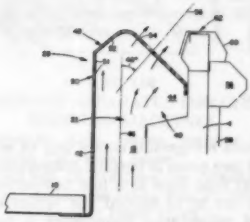
1. A closed circuit refrigeration system, comprising:
compressor means;
condenser means coupled to the output of said compressor means;
receiver means coupled to the output of said condenser means, said receiver means adapted to maintain a preselected condenser pressure upstream to said condenser means;
evaporator means connected between the receiver means and compressor return;
bypass conduit means connected by one end between said condenser means output and the input of said receiver means and by the opposite end between the output of said receiver means and the input of said evaporator means; and
means selectively controlling the flow of refrigerant through said bypass conduit means and said receiver means, respectively, as a function of the temperature of the refrigerant below its condensing temperature mesured at a point downstream of said condenser means.

4,457,139

REFRIGERATED DISPLAY CASE HAVING AMBIENT AIR DEFROST

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Continuation-in-part of Ser. No. 117,571, Feb. 1, 1980, which is a continuation-in-part of Ser. No. 60,459, Jul. 25, 1979, Pat. No. 4,295,340, which is a continuation-in-part of Ser. No. 11,804, Feb. 14, 1979, abandoned, and a continuation-in-part of Ser. No. 295,542, Aug. 24, 1981. This application Mar. 25, 1982, Ser. No. 361,798
Int. Cl.³ A47F *3/04*
U.S. Cl. 62—256 **20 Claims**



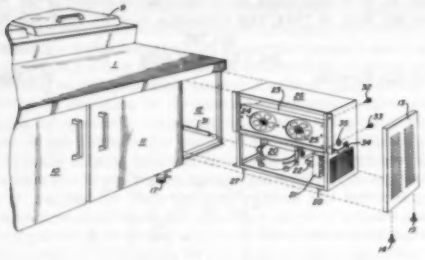
1. In a refrigerated display case having front, bottom, rear, top and side outer walls and having an access opening in said front wall for enabling removal of refrigerated products and a product storage space arranged contiguous to said access opening, said case comprising at least one air conduit positioned about said storage space and having first and second openings at opposite ends thereof formed between interior air conduit panels and said outer walls of said display case and each of said openings being located at one side of said access opening; refrigeration means located within said air conduit for refrigerating air therein; air circulating means arranged within said conduit for moving air within said conduit in a forward direction and ejecting air out of said first opening and into said second opening during a refrigeration cycle; the improvement comprising: air defrost means for reversing the flow direction of air within said air conduit to enable ambient air to be drawn in from outside of said display case through said first opening and to expel a defrost air band from said second opening during a defrost cycle and for switching the operation of said display case between a refrigeration cycle and a defrost cycle; and air flow control means for causing substantially all air leaving said air conduit during substantially the entire defrost [illegible]e to flow away from said case when such air is flowing i[illegible]l reverse direction so that such air is prevented from reente[illegible]g said air conduit, said air flow control means comprising an air flow direction chamber integrally formed with said second opening and positioned toward the outside of said display case from the central plane of said air conduit, said air flow direction chamber enabling the air band being ejected out of said second opening to change flow direction whereby a significant horizontal velocity vector directed away from the central plane of said air conduit is imparted to the ejected defrost air band, and an air grille positioned over said air conduit and said direction chamber, said air grille having a perforated air ejector planar surface integrally formed therein and positioned over said air flow direction chamber such that a perpendicular plane passing through said planar surface has an angle of at least 20° with a vertical plane passing through the center of said second opening and extending outwardly away from said vertical plane.

4,457,140

MODULAR REFRIGERATION UNIT AND CABINET SYSTEMS THEREWITH

Agostino A. Rastelli, Grove City, Ohio, assignor to Leitner Corporation, Ohio

Filed May 21, 1982, Ser. No. 380,708
Int. Cl.³ F25D 23/12
U.S. Cl. 62—261 4 Claims



1. A foodstuffs refrigerator comprising an integral cabinet having at least two zones in separate compartments including:

a. a confined food zone in a first compartment in which foodstuffs are to be located and within which zone a controlled refrigeration temperature is maintained and which zone is free of mechanical equipment; and,

b. a separate equipment zone in a separate compartment adjacent to the food zone containing a modular refrigeration unit which is independently removeable from the compartment of the equipment zone and which unit provides the controlled temperature for the food zone; said modular refrigeration unit integrally including compressor, condenser, evaporator, metering means and means for connecting said components in the relationship of a refrigeration cycle, and an air circulating means to provide a flow of air to and from the evaporator means of the refrigeration unit;

and in which the food zone and equipment zone are connected by duct means between the two compartments for directing the flow of air provided from the air circulating means of the modular refrigeration unit contained within the equipment zone to a predetermined area of the food zone, and for directing a flow of air from the food zone to the air circulating means, whereby air is recirculated from the food zone through the evaporator means of the refrigeration unit in a cyclical manner.

4,457,141

CATALYTIC CONVERTER FOR TREATING EXHAUST GASES

Hachiro Yoshioka, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Apr. 9, 1982, Ser. No. 367,224
Claims priority, application Japan, Apr. 10, 1981, 56-53161
Int. Cl.³ F01N 3/28
U.S. Cl. 60—299 3 Claims

1. A catalytic converter for treating exhaust gases, comprising:

(a) an exhaust manifold having a downstream end via which exhaust gases can exit from the exhaust manifold;

(b) a casing having an upper end and a lower part spaced from each other in a vertical direction, the casing having a hollow extending therethrough between the upper end and the lower part thereof, the upper end of the casing being positioned immediately below and in air communication with the downstream end of the exhaust manifold so that exhaust gases can enter the casing from the exhaust manifold;

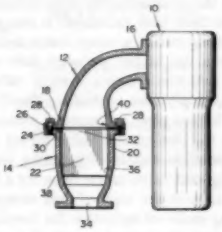
(c) means for fixing the casing to the exhaust manifold;

(d) a gasket positioned between the upper end of the casing and the downstream end of the exhaust manifold for providing an airtight seal with respect to the combination of the exhaust manifold and the casing;

(e) a catalyst;

(f) a carrier for carrying the catalyst thereon, the carrier having upper and lower ends spaced from each other in the vertical direction, the carrier having a plurality of passages extending therethrough between the upper and lower ends thereof, the carrier being positioned in the casing;

(g) the lower part of the casing having a tapered inner-surface, the lower end of the carrier having a tapered outer-surface matching the tapered inner-surface of the casing, the tapered outer-surface of the carrier being in contact with the tapered inner-surface of the casing;



(h) the downstream end of the exhaust manifold defining an inside step immediately above the upper end of the carrier;

(i) the gasket having a part extending between the step on the exhaust manifold and the upper end of the carrier;

(j) means for pressing the gasket against the upper end of the carrier via the step on the exhaust manifold and thereby urging the tapered outer-surface of the carrier against the tapered inner-surface of the casing, whereby the carrier is held at the upper and lower ends thereof by the casing and the exhaust manifold; and

(k) the carrier being made of metal and the casing being made of metal having a coefficient of thermal expansion approximately equal to that of the metal forming the carrier.

4,457,142

METHOD OF CHILLING MATERIALS AND CHILLING CONTAINER

Peter Bucher, Pfäffikon, Switzerland, assignor to Firma Heinrich Bucher, Switzerland

Filed Oct. 13, 1982, Ser. No. 433,966
Claims priority, application Switzerland, Oct. 16, 1981, 6635/81
Int. Cl.³ F25D 3/12
U.S. Cl. 62—388 6 Claims

1. A container for chilling material received therein via a chilling agent, the combination comprising:

a first closed chamber for receiving the material and having insulated walls including an insulated door;

a second closed chamber for receiving the chilling agent therein,

said second chamber being insulated and located above said first chamber; and

means for creating a forced flow, via a pressure differential, of the chilling agent from said second chamber, down a first wall of said first chamber, and into and then out of said first chamber, and for creating convection currents of the chilling agent in said first chamber,

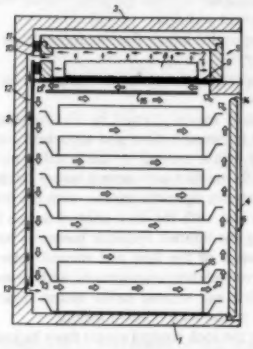
said means comprising

a continuous pressure passage extending along said first wall of said first chamber,

an upper opening in said pressure passage located adjacent said second chamber and communicating with the inte-

rior of said second chamber, said upper opening being smaller in dimension relative to the interior of said second chamber,

a lower opening in said pressure passage located adjacent the bottom of said first chamber and communicating with the interior of said first chamber, and



a second upper opening located adjacent the top of said first chamber and leading to the atmosphere, said second upper opening being located in a wall of said first chamber other than said first wall,

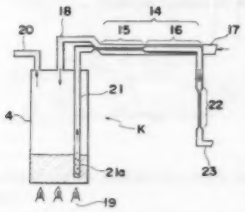
said continuous pressure passage having no openings therein between said upper and lower openings.

4,457,143

ABSORPTION TYPE HEAT PUMP DEVICE

Isao Takeshita, Neyagawa; Yoshiaki Yamamoto, Katano, and Hiroyoshi Tanaka, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 1, 1983, Ser. No. 482,312
Claims priority, application Japan, Apr. 8, 1982, 57-58823
Int. Cl.³ F25B *15/00*
U.S. Cl. 62—476 **8 Claims**



1. An absorption type heat pump device comprising:

a generator for generating refrigerant vapor from weak solution having a large amount of refrigerant dissolved therein by heating the weak solution such that the weak solution is converted into strong solution having a reduced content of the refrigerant;

a condenser for liquefying the refrigerant vapor through cooling thereof;

an evaporator for evaporating the liquefied refrigerant through absorption of heat thereinto;

an expansion valve for maintaining a difference in pressure between said condenser and said evaporator at a predetermined value;

an absorber for absorbing the refrigerant vapor thereinto such that the weak solution is produced, with pressure in said absorber being maintained at a predetermined low evaporation pressure;

a solution pump for feeding the weak solution to said generator through pressurizing of the weak solution;

a passage member for leading the strong solution from said generator to said absorber; and

a heat exchanger for performing heat exchange between the strong solution and the weak solution fed from said absorber to said generator by said solution pump, which is provided on said passage member so as to be interposed between said generator and said absorber;

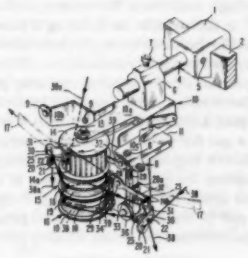
said heat exchanger and/or said passage member between said generator and said heat exchanger being provided with a portion in which a pressure drop is made larger than a drop in equilibrium pressure resulting from a temperature drop, whereby flow of the strong solution from said generator to said absorber is controlled through utilization of the refrigerant vapor produced due to the pressure drop in said portion.

4,457,144

YARN FEEDING APPARATUS FOR CIRCULAR KNITTING MACHINES

Masatoshi Sawazaki, Kobe, Japan, assignor to Precision Fukuhara Works, Ltd., Kobe, Japan

Filed Sep. 18, 1981, Ser. No. 303,633
Claims priority, application Japan, Feb. 17, 1981, 56-21770
Int. Cl.³ D04B *15/48*
U.S. Cl. 66—132 T **1 Claim**



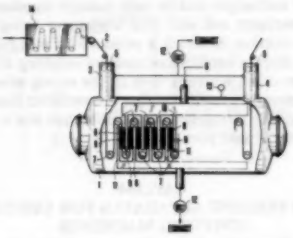
1. Self actuated positive yarn feeding apparatus to feed yarn to a circular knitting machine when a demand for the yarn is made by the machine and to cease feeding the yarn upon termination of the demand for the same by the machine, the yarn being under tension when being fed and being without tension when not fed, comprising a cylindrically shaped yarn feed wheel for rotation about a vertical axis, means to rotate the wheel, the periphery of the wheel providing first and second cylindrically shaped zones having relatively high and relatively low friction surfaces, respectively, fixed and movable yarn guiding eyelets, the eyelets and the wheel being disposed so that a yarn extending from its source is threaded through a fixed and a movable yarn eyelet, is then guided about the periphery of the wheel, is then threaded a movable and a fixed yarn eyelet, and then extends to the machine, the position of the yarn on the periphery of the wheel being shiftable between positions on the zones thereof, the arrangement being such that the yarn is fed by the wheel when it is on the periphery of the first zone and is not fed by the wheel when it is on the periphery of the second zone, and means actuated by the yarn in response to demand and non-demand of the yarn by the machine to shift the position of the yarn between its described positions on the periphery of the wheel, the means comprising a movable bracket having the movable eyelets spacedly disposed therein and being movable so that the eyelets are movable about a common axis which intersects with the vertical axis of the wheel, and with the fixed eyelets being spaced from the common axis.

4,457,145

APPARATUS FOR TREATING A TEXTILE PRODUCT CONTINUOUSLY WITH THE USE OF LOW-TEMPERATURE PLASMA

Yoshikazu Sando; Hiroshi Ishidoshiro; Matsuo Minakata, all of Wakayama, and Tokuju Goto, Nara, all of Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Mar. 29, 1983, Ser. No. 479,961
Int. Cl.³ D06B *3/12*
U.S. Cl. 68—5 E **1 Claim**



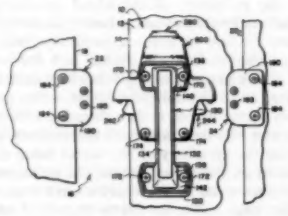
1. An apparatus for treating a textile product continuously with the use of low-temperature plasma comprising; a reactor provided with an inlet and an outlet, an inlet seal mechanism and an outlet seal mechanism for maintaining vacuum within the reactor while allowing a textile product to pass continuously into, through, and out of the reactor, a plurality of guide rolls provided in the reactor for forming a passage for transporting the textile product through the reactor in a zigzag manner thereby forming snaky undulations of the material, and a plurality of pairs of electrode plates spacedly provided in the reactor with the textile product passage located between the plates of each pair, a plurality of gas nozzles within the reactor for supplying a gas for producing low-temperature plasma to the spaces between respective pairs of the electrode plates, a vacuum mechanism for producing vacuum in the interior of the reactor, and means for supplying a high frequency electric wave to each pair of the electrode plates to produce low-temperature plasma between the plates of each pair.

4,457,146

SLIDING DOOR LOCK

Lee S. Weinerman, Medina, Ohio, assignor to The Eastern Company, Strongsville, Ohio

Filed Jun. 16, 1982, Ser. No. 389,045
Int. Cl.³ E05B *15/02, 65/08*; E05C *3/16*
U.S. Cl. 70—100 **55 Claims**



1. A door lock, comprising:

(a) housing means for mounting on a sliding door for movement with the door along a path of travel between a first position wherein the door closes an access opening, and a second position wherein the door provides access through the opening;

(b) first and second strike means for mounting at spaced positions along the path of travel on opposite sides of the access opening;

(c) first and second rotary latch bolt means carried by the housing means near opposite sides thereof, the first rotary latch bolt means being operable to latchingly engage the first strike means when the door is in its first position, and the second rotary latch bolt means being operable to latchingly engage the second strike means when the door is in its second position;

(d) exterior operator means for mounting on an exterior side of the door;

(e) interior operator means for mounting on an interior side of the door;

(f) lock control means carried by the housing means for movement between locked and unlocked positions; and,

(g) operating means carried by the housing means for connecting with the first and second rotary latch bolt means, with the exterior operator means, with the interior operator means, and with the lock control means for:

(i) enabling the interior operator means to be operated to release each of the first and second rotary latch bolt means from latching engagement with an associated one of the first and second strike means regardless of the position of the lock control means;

(ii) moving the lock control means from its locked position to its unlocked position in response to operation of the interior operator means when the lock control means is in its locked position;

(iii) enabling the exterior operator means to be operated to release each of the first and second rotary latch bolt means from latching engagement with an associated one of the first and second strike means when the lock control means is in its unlocked position;

(iv) preventing the exterior operator means from being operated to release either of the first and second rotary latch bolt means from latching engagement with an associated one of the first and second strike means when the lock control means is in its locked position; and,

(v) moving the lock control means from its locked position to its unlocked position in response to either of the first and second rotary latch bolt means being brought into latching engagement with an associated one of the first and second strike means when the lock control means is in its locked position.

4,457,147

COMBINATION LOCK

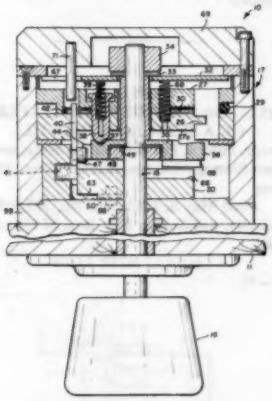
Edward H. Cumpston, 6 Stonehedge Dr., Bennington, Vt. 05201

Filed Dec. 7, 1981, Ser. No. 327,814
Int. Cl.³ E05B *37/16*
U.S. Cl. 70—213 **25 Claims**

1. A combination lock having an array of two-position combination elements, a reset means for simultaneously moving all of said elements into a first position, a reader arranged to be blocked from movement unless all of said elements are disposed in a preselected combination of said first and second positions, and entering means for moving preselected elements into said second position to fulfill said combination and allow said reader to move, said lock comprising:

a. a lock element movable between a locked and an unlocked position;

b. a movable latch carried on said lock element for holding said lock element in said locked position; and



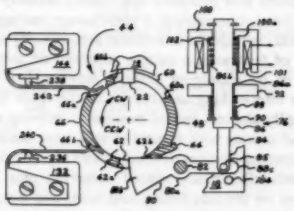
c. means responsive to movement of said reader after fulfilling said combination for unlatching said latch to allow movement of said lock element from said locked position.

4,457,148

ELECTRONIC DIGITAL COMBINATION LOCK

Fritz H. Johansson, 2512 South Playa, Mesa, Ariz. 85202, and Gordon P. Hampton, 10621 Portal Ave., Cupertino, Calif. 95014

Continuation of Ser. No. 925,385, Jul. 17, 1978, abandoned. This application May 27, 1981, Ser. No. 267,813
Int. Cl.³ E05B *49/00*
U.S. Cl. 70—278 **8 Claims**



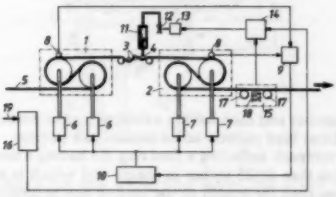
1. A electronic digital combination lock, comprising:
(a) a frame;
(b) bolt means for moving in relation to said frame;
(c) electronic circuit means, responsive to a predetermined combination signal, for generating a control signal, including switch means, selectively actuatable, for generating digital signals, said switch means being supported adjacent said frame to be unexposed to a user of the lock;
(d) first handle means, coupled to said frame, for moving said bolt means, including means, selectively actuatable, for controlling said switch means to produce the predetermined combination signal;
(e) means, responsive to the control signal, for permitting said first handle means to move said bolt means a certain distance;
(f) second handle means for moving said bolt means the certain distance; and
(g) key operated means for moving said bolt means the certain distance, said first handle means, said second handle means and said key operated means moving said bolt means independently of one another.

4,457,149

APPARATUS FOR PRODUCING COILS OF METAL STRIP

Hans J. Weinzinger, and Rudolf Pichler, both of Linz, Austria, assignors to Veest-Alpine Aktiengesellschaft, Linz, Austria

Filed Feb. 24, 1982, Ser. No. 351,650
Claims priority, application Austria, Mar. 26, 1981, 1404/81
Int. Cl.³ B21C *19/00, 47/02;* B21D *1/02, 1/05*
U.S. Cl. 72—10 **2 Claims**



1. In a plant for producing a coil of metal strip, wherein a longitudinal curvature in one sense is imparted to successive portions of a straightened metal strip by coiling said successive metal strip portions, each one of said coil portions having a diameter and said longitudinal curvature depending on said coil portion diameter; said plant comprising
(a) a straightening roller arranged to be positioned in engagement with said metal strip along a path through which said successive metal strip portions are guided to impart a transverse curvature to said strip, said transverse curvature having a value determined by said engagement position of said straightening roller,
(b) means arranged downstream of said straightening roller for detecting said transverse curvature value,
(c) means for controlling said engagement position of said straightening roller by said detected value,
(d) a computer computing a desired value of said transverse curvature, and
(e) control means acting upon said engagement position controlling means to move said straightening roller until said detected transverse curvature value equals said desired value whereby a longitudinal curvature equal to, and in a sense opposite to the sense of, said longitudinal curvature of said coiled metal strip portion is imparted to said successive portions before said metal strip is coiled.

4,457,150

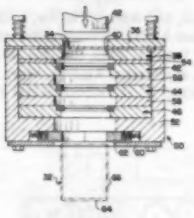
METHOD OF FORMING D&I CANS FROM COATED STEEL

William T. Saunders; Lowell W. Austin, both of Weirton, W. Va.; John R. Smith, Richmond, Ohio, and William D. Bingle, Endicott, N.Y., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed Feb. 11, 1982, Ser. No. 347,705
Int. Cl.³ B21D *22/28*
U.S. Cl. 72—47 **9 Claims**

1. A process for forming a drawn and ironed container from flat sheet steel comprising,
applying a nickel-zinc alloy coating of substantially uniform thickness to both sides of a sheet of flat rolled steel of a gage and temper suitable for drawing and ironing, said alloy coating containing zinc in the amount of about 2 to 12 weight percent with the remainder consisting essentially of nickel.
drawing the nickel-zinc alloy coated steel into a cup having sidewall and bottom wall thicknesses substantially equal to the thickness of the coated steel, and

ironing the sidewall of the drawn cup to reduce the sidewall thickness and increase the height to produce a drawn and ironed can body by supporting the drawn cup on a mandrel and passing the cup through an ironing ring toolpack including at least two ironing ring dies aligned with one



another and each having a conical lead-in portion, a cylindrical land portion and a conical exit portion,

the toolpack including a final ring die having a land which is less than 0.025 inches in length and which is sustantially less than the length of the land of any preceding die ring in the toolpack.

4,457,151

METHOD OF RECALIBRATING A WORN CONICAL, ESPECIALLY CURVED TUBULAR MOLD

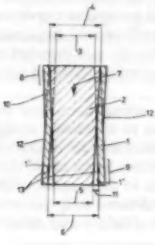
Diethelm Mettler, Küsnacht, Switzerland, assignor to Accumold AG, Fischenthal, Switzerland

Continuation of Ser. No. 164,353, Jun. 30, 1980, abandoned. This application Feb. 2, 1982, Ser. No. 345,090

Claims priority, application Switzerland, Jul. 20, 1979, 6768/79

Int. Cl.³ B21D *26/08*

U.S. Cl. 72—56 **5 Claims**



1. A method of recalibrating a worn, conical, especially curved tubular mold for continuous casting of a metal, especially steel, comprising the steps of:

providing a spent, conical tubular mold having a hollow mold compartment;

inserting a conically configured calibration mandril into the hollow mold compartment of the conical tubular mold such that a small end surface of the calibration mandril is introduced into the tubular mold from a side thereof constituting the strand outlet side of the tubular mold prior to such tubular mold having been spent;

applying explosive means to the outer surface of the tubular mold;

detonating said explosive means so that the explosive force of the detonation deforms the tubular mold such that its internal dimensions assume those of the external dimensions of the calibration mandril and the strand outlet side of the tubular mold becomes the metal pouring-in side of the tubular mold which is now capable of being reused; and

enlarging the cross-sectional area of the original strand outlet side of the tubular mold, prior to recalibration thereof, in order to facilitate the insertion of the calibration mandril.

4,457,152

APPARATUS FOR CHANGING THE TAPERED ROLLS OF A SKEW ROLLING MILL

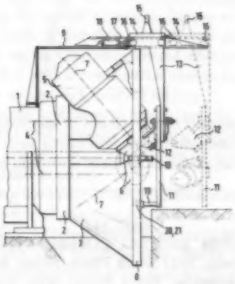
Alexandr Svagr, Hilden, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed May 6, 1982, Ser. No. 375,569

Claims priority, application Fed. Rep. of Germany, May 16, 1981, 3119647

Int. Cl.³ B21B *31/08*

U.S. Cl. 72—78 **7 Claims**



1. Apparatus for changing the rolls of a skew rolling mill having a plurality of roll-heads skew-mounted on a rotor rotatable about a direction of feed axis of the material being rolled and a tapered roll rotatably and axially slidably mounted in each roll-head, comprising: a roll-change carriage, means to support said carriage for movement substantially parallel to the direction of feed axis, a carrier mounted on said carriage, a plurality of roll-clamping devices mounted on said carrier, means for interlocking said carrier to the rotor in a predetermined axially-aligned, spaced position to prevent relative rotation of said carrier with respect to said rotor during operation of said clamping devices to remove and replace the rolls comprising circumferentially spaced centering pins mounted on said carrier on the side facing said rotor and cooperating circumferentially spaced centering bores in said rotor adapted to receive said pins when said carrier is moved into position for clamping, and means to move said clamping devices relative to said carrier axially with respect to the rotatable axis of the rolls.

4,457,153

METHOD AND APPARATUS FOR FORMING INTERNAL THREADS IN TUBES

John X. Russell, Troy, Mich., assignor to Apex Corporation, Roseville, Mich.

Filed Mar. 29, 1982, Ser. No. 363,316

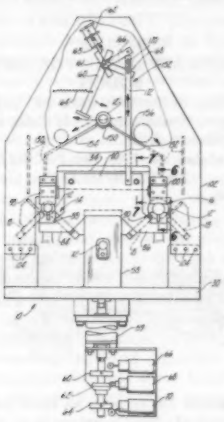
Int. Cl.³ B21H *3/08*

U.S. Cl. 72—125 **16 Claims**

1. A fixture (10) for forming internal threads in a tube (12) by a non-cutting process using a tap (204) removably connected to a tapping unit, said fixture comprising:

a movable head (34) carrying both a tube clamp member (36) and a tap clamp member (88) for clamping said tube (12)

and tap (204), respectively, at various positions of the movable head (34) relative to a work station (14) for



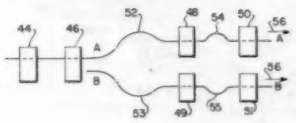
supporting the tube (12) during the thread forming process.

4,457,154

CONTROL METHOD FOR MULTI-STRAND ROLLING MILL

Koichi Ohba, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 246,316, Mar. 23, 1981, abandoned. This application Apr. 4, 1983, Ser. No. 480,090
Int. Cl.³ B21B *1/20, 37/08*
U.S. Cl. 72—234 4 Claims



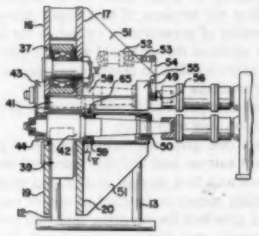
1. A method for controlling the rolling stands of a multi-strand rolling mill having a plurality of roll stands disposed in succession for simultaneously rolling a plurality of strand workpieces, comprising the steps of tracking the trailing end and the leading end of each of the strand workpieces, and each time the trailing end of at least one strand workpiece leaves a roll stand, setting the rolling speeds of the roll stands upstream of the roll stand which the end of said at least one strand workpiece has left to a first rolling speed and the rolling speed of the roll stand which the end of the strand workpiece has left to a second roll speed, and setting the rolling speeds of the roll stands downstream of the roll stand which the strand workpiece has left to a third speed, the speeds being in a ratio for keeping the mass flow of the strand workpieces throughout the multi-strand rolling mill substantially constant.

4,457,155

OVERHUNG BAR ROLLING MILL STAND AND TWO-AXIS GAUGE CONTROL SYSTEM

Werner W. Eibe, Pittsburgh, Pa., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Mar. 3, 1982, Ser. No. 354,368
Int. Cl.³ B21B *13/14*
U.S. Cl. 72—241 11 Claims



1. An overhung bar mill comprising upper and lower roll housings, upper and lower pairs of backup rolls journalled in the upper and lower roll housings respectively, upper and lower drive shafts positioned in the bights of the upper and lower pairs of backup rolls respectively in pressure-transmitting relation therewith and with each other, upper and lower overhung rolls affixed to the ends of the upper and lower drive shafts respectively adjacent the backup rolls, and vertical loading means connected between the upper and lower housings.

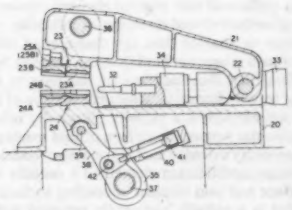
11. The method of rolling a hot bar in grooved rolls of an overhung mill stand comprising simultaneously and automatically measuring the vertical movement of the rolls during rolling at the overhung side of the mill stand, measuring the horizontal movement of the rolls during rolling at the drive side of the mill stand, adjusting the vertical mill modulus at the overhung side of the mill stand in response to the vertical movement only and adjusting the horizontal mill modulus at the drive side of the mill stand in response to the horizontal movement only so as to maintain uniform cross section from end-to-end of a rolled bar subject to differential cooling.

4,457,156

HORIZONTAL TUBE UPSETTER

Takashige Yamamura, Kobe, and Satosi Matsumoto, Toyonaka, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jan. 27, 1982, Ser. No. 343,217
Claims priority, application Japan, Jan. 29, 1981, 56-12844[U]
Int. Cl.³ B21D *41/02*
U.S. Cl. 72—316 11 Claims



1. A horizontal upsetter having a bed, a grip tong having one end thereof pivotally connected to one end of said bed through a shaft, a row of horizontally split dies mounted opposingly across the outer free ends of said bed and grip tong and consist-

ing of upper movable dies and lower fixed dies each of the upper movable dies and lower fixed dies having an upset die section and a clamp die section to define a clamping cavity between said clamp die sections and an upset cavity between said upset die sections, a punch for each said upset cavity, said upsetter comprising:

a punch for each of said upset cavities, each said punch being movable into a respective upset cavity to upset a workpiece;

a plurality of piece dies which separately comprise said clamp die sections of said upper movable dies;

a plurality of pressurizing cylinders for operating said clamp die sections through said separate piece dies independently of each other to clamp workpieces between said clamp die sections;

at least one pull rod having one end pivoted at a first pivot axis on said grip tong;

at least one grip link having one end pivoted at a second pivot axis on said bed and a second end pivoted at a third pivot axis to a second end of said grip link; and

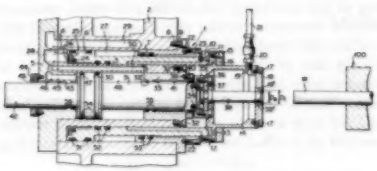
actuating means connected to one of each said pull rod and said grip link for pivoting said pull rod and said grip link, whereby said dies are opened and closed.

4,457,157

PIPE END EXPANDING OR CONTRACTING DEVICE UTILIZING IRONING

Masaru Masaki, Aichi; Yoshinori Ito; Akihiko Inoue, both of Toyota, and Munetaka Toda, Kariya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 53,524, Jun. 29, 1979, Pat. No. 4,297,867.
This application Jul. 28, 1981, Ser. No. 287,830
Claims priority, application Japan, Nov. 15, 1978, 53-140608
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—354 **4 Claims**



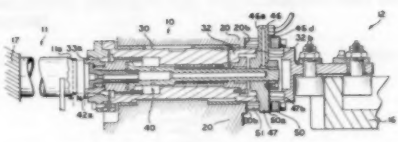
1. A pipe end processing device, comprising a cylinder-piston device having a body structure, a diameter modification element having a cylindrical surface for uniformly modifying the diameter of an end portion of a pipe over a certain axial length, and an ironing element having a circular squeezing surface coaxial with and convex toward said cylindrical surface of said diameter modification element and arranged for squeezing said end portion of said pipe against said cylindrical surface of said diameter modification element over said certain axial length, the diameter of an apex portion of said circular squeezing surface of said ironing element convex toward said cylindrical surface of said diameter modification element being either larger or smaller than the diameter of said cylindrical surface of said diameter modification element by an amount slightly less than the thickness of the pipe to be processed according to whether said cylindrical surface of said diameter modification element is a radially outwardly oriented surface and said circular squeezing surface of said ironing element is a radially inwardly oriented surface or said cylindrical surface of said diameter modification element is a radially inwardly oriented surface and said circular squeezing surface of said ironing element is a radially outwardly oriented surface, respectively, wherein the cylinder-piston device comprises two pistons arranged coaxially, one of which reciprocatingly drives the diameter modification element over said certain axial length relative to said body structure by fluid pressure being applied to its one end or its other end, and the other of which reciprocatingly drives the ironing element at least over said certain axial length relative to said body structure by fluid pressure being applied to its one end or its other end.

4,457,158

METHOD AND APPARATUS FOR NECKING CAN BODIES

Edward C. Miller, Broomfield; John M. Ury, Boulder, and Milton S. Hager, Westminster, all of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Jan. 28, 1983, Ser. No. 461,782
Int. Cl.³ B21D *51/26*
U.S. Cl. 72—354 **5 Claims**



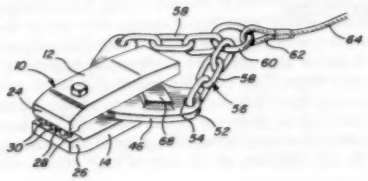
1. In an apparatus for necking an open can portion of a cylindrical side wall of a sheet metal can body, including a base member, a die member longitudinally reciprocatable with respect to said base member, a pilot assembly coaxially situated and longitudinally reciprocatable with respect to said die member, the pilot assembly including means coacting with the base to limit the forward travel of the pilot assembly with respect to the base, and biasing means for biasing the pilot assembly forwardly with respect to the die member, the improvement comprising stop means fixed to the base and coacting with said pilot assembly coacting means to limit the rearward travel of the pilot assembly with respect to the die member and base.

4,457,159

SHEET METAL PULL CLAMP

Davis R. Jarman, 612 Ward Dr., and Virgil H. Hinson, 206 Fairway Oaks Dr., both of Brunswick, Ga. 31520

Filed Aug. 18, 1982, Ser. No. 409,313
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—422 **6 Claims**



1. A sheet metal pull clamp including a pair of elongated generally parallel force levers, connecting means in the form of an adjustable length shank-type fastener extending and loosely secured through corresponding portions of said levers intermediate their opposite ends for substantially coplanar oscillation of said levers relative to each other to inversely swing the pairs of corresponding lever ends toward and away from each other, one pair of corresponding ends of said levers defining jaw ends between which sheet metal marginal edge portions may be gripped, the other pair of corresponding ends of said levers defining moment arm ends, a pair of cam levers including corresponding base and free ends, pivot means pivotally mounting said base ends between and from said moment arm ends for relative angular displacement of said cam levers about an axis generally paralleling said shank-type fasteners between first positions with said free ends of said cam levers divergent

from opposite sides of a plane containing said force levers and second positions with said free ends swung toward the last mentioned plane, a pair of elongated tension member sections having first and second end portions, said first end portions being anchored to said free ends of said cam levers and said second end portions being adapted to have force applied thereto for displacing said second ends away from said jaws ends of said force levers, said cam levers and moment arm ends including a first set of juxtaposed surfaces and said cam levers defining a second set of juxtaposed surfaces, at least one of said sets of juxtaposed surfaces including coacting wedge surfaces spaced inward of the terminal ends of said moment arm ends for wedging said moment arm ends apart responsive to swinging of said cam levers toward said second positions thereof, said base ends of said cam levers having registered bores formed therethrough, said pivot means pivotably connecting said base ends of said cam levers between and from the moment arm ends of said force levers including opposing recesses formed in said moment arm ends and a pivot shaft extending between and having its opposite ends seated in said recesses with intermediate length portions of said pivot shaft being rotatably received through said registered bores, said pivot shaft also interconnecting said force levers against angular displacement relative to each other about said shank-type fastener.

4,457,160

AUTOMATIC PUNCHING AND BENDING MACHINE

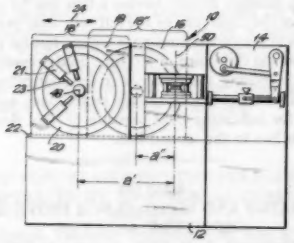
Adolf Wiinsch, Haus Nr. 210, D-8959 Seeg-Ried, Fed. Rep. of Germany

Continuation of Ser. No. 108,528, Dec. 31, 1979. This application Jan. 27, 1982, Ser. No. 343,079

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1979, 2925840

Int. Cl.³ B21J *13/00*

U.S. Cl. 72—446 **4 Claims**



1. An improvement in an automatic punching and bending machine for punching and bending stock material, in form of a band of work pieces fed by a draw-in device, the draw-in device, a punching device and a bending-device being mounted in series in the feeding direction of the band of work pieces on a machine base, the improvement comprising: a slide guide rail arrangement mounted on the machine base and extending parallel with the feeding direction of the band of work pieces, the bending device being displaceably guided in said slide guide rail arrangement between a first end position and a second end position laterally offset to the feeding direction with respect to the punching device whereby, in one end position of the bending device, said bending device and the punching device are in an overlapping condition as seen perpendicular to the feeding direction of the band of work pieces.

4,457,161

GAS DETECTION DEVICE AND METHOD FOR DETECTING GAS

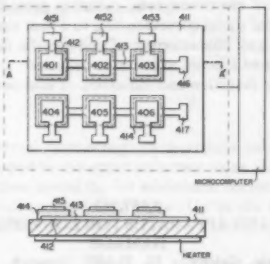
Shoichi Iwanaga, Yokohama; Nobuo Sato, Yokosuka; Akira Ikegami, Yokohama; Tokio Isogai, Fujisawa; Takanobu Noro, and Hideo Arima, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1981, Ser. No. 366,304

Claims priority, application Japan, Oct. 9, 1980, 55-140470

Int. Cl.³ G01N *27/12*

U.S. Cl. 73—23 **21 Claims**



1. A gas detection device for detecting concentration of any one of predetermined different gases in a gas mixture, said device comprising a substrate, a plurality of gas adsorbing sensors formed on said substrate, each of said sensors having different gas selectivities to the gases in the gas mixture, the number of said sensors being equal to the number of the different gases to be detected, at least two sensors being sensitive to at least two gases but having different sensitivities to said at least two gases, and each of said sensors adapted to provide an output having one or more output components, each component having a dimension of electrical conductivity and being proportional to the concentration of one of said different gases within a predetermined range of temperature of the sensor, said output of each sensor being the sum of said one or more output components, and means for computing the gas concentration of said any one of predetermined different gases using the outputs of said sensors produced at a temperature within said range.

4,457,162

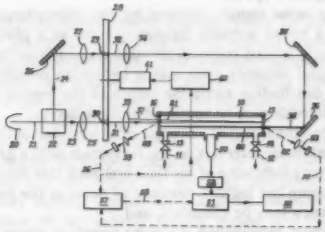
MULTI-FREQUENCY PHOTO-ACOUSTIC DETECTOR

William F. Rush, Tinley Park, and James E. Huebler, Brookfield, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Sep. 17, 1982, Ser. No. 419,231

Int. Cl.³ G01N *21/17*

U.S. Cl. 73—24 **25 Claims**



17. An apparatus for detecting a single specific gas or solid material in a mixture or a number of specific mixed gases or solid materials comprising:

means defining a sample chamber for containing said material;

means for generating at least one beam of electromagnetic radiation;

means for simultaneously passing incident on said material in said sample chamber multiple beams of modulated electromagnetic radiation at wavelengths corresponding to a characteristic absorbed wavelength of at least one of the chemicals in said material to be detected;

means for acoustical detection of multiple acoustical signals at specific frequencies upon absorption of said modulated beams of electromagnetic radiation providing an output electrical signal corresponding to a beat tone or a combination tone characteristic of said specific material or said number of specific mixed materials; and

means for detection and indication of said output electrical signal.

4,457,163

METHOD AND APPARATUS FOR LOCATING PIPELINE DAMAGE

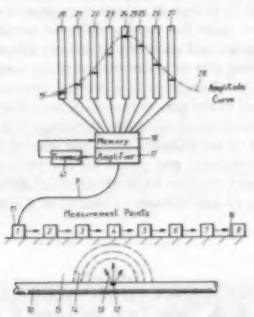
Eugen Jäckle, Galenweg 16, D-8601 Baunach, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 363,879

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112829

Int. Cl.³ G01M *3/24*

U.S. Cl. 73—40.5 A **2 Claims**



1. A method of pipeline damage and fluid leak location by acoustical monitoring of the soil surrounding a defective pipe and recording emission noise by at least one microphone means connected with the input of an amplifier means, said method comprising the steps of:

applying noise signals received by the microphone means over a broad acoustic frequency band at a plurality of regularly spaced intervals through the amplifier to a digital signal memory such that a histogram indicating the noise distribution along the length of the pipe at each of the intervals may be retrieved and displayed,

comparing the frequency content of at least one of the highest peak noise intervals on the histogram with a preferred frequency indicative of the fluid leak such that the interval containing the highest intensity of noise at the preferred frequency may be identified, and

as necessary, rerecording the noise signals at closer spaced intervals into the digital signal memory through a relatively narrow bandpass audio filter containing the preferred frequency such that an additional histogram may be displayed at the closer intervals to precisely locate the pipeline damage.

4,457,164

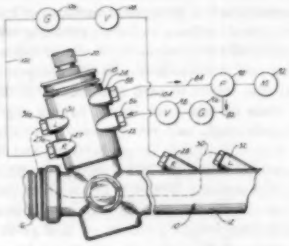
TESTING OF OIL SEALS IN POWER-ASSISTED RACK AND PINION STEERING UNITS

John H. Castoe, 10234 McVine St., Sunland, Calif. 91040

Filed Aug. 27, 1982, Ser. No. 412,083

Int. Cl.³ G01M *3/26*

U.S. Cl. 73—46 **10 Claims**



1. An oil seal test unit for testing oil leakage in the oil seals of a power-assisted rack and pinion steering unit, in which the rack and pinion unit includes (a) a pinion housing having a main supply pressure inlet and outlet, a left turn fluid pressure connection, and a right turn fluid pressure connection; (b) a rack housing with a left turn fluid pressure fitting and a right turn fluid pressure fitting; and (c) right and left tie rod ends at opposite ends of the rack and pinion steering unit, the test unit comprising:

a source of hydraulic fluid under pressure;

main hydraulic pressure supply and return lines leading from and to the source of fluid under pressure, the main pressure supply and return lines each being adapted for connection to the main supply pressure inlet and outlet of the pinion housing;

a main pressure gauge for indicating fluid pressure flowing in the main supply line;

means for simulating steering pressure on either the right or left tie rod end of the steering unit; and

a steering pressure divider having a first line for connection to either the right turn or the left turn fluid pressure connection of the pinion housing, a second line for connection to either the right turn or left turn fluid pressure fitting of the rack housing, a divider valve for controlling the flow of fluid from the first line to the second line, and a divider gauge for indicating fluid pressure of fluid flowing from the first line to the second line.

4,457,165

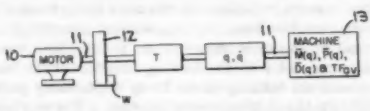
APPARATUS AND METHOD FOR DRIVE SHAFT SIGNATURE ANALYSIS

James L. Wiederrich, Lodi, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Sep. 1, 1982, Ser. No. 413,926

Int. Cl.³ G01M *1/10*

U.S. Cl. 73—116 **12 Claims**



1. Apparatus for driving a single degree of freedom holonomic mechanical system and for sensing system characteristics, comprising

a drive motor having an output drive shaft,

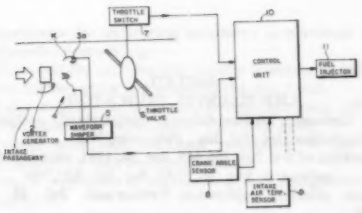
means for providing a synchronous periodic oscillation on said output drive shaft,
means for sensing said periodic oscillation torque T coupled to said output drive shaft,
means for detecting drive shaft angular position q coupled to said output drive shaft,
means for obtaining drive shaft angular speed q within the system,
whereby said system kinetic energy, potential energy, viscous damping, and total nonviscous friction characteristics may be described.

4,457,166

ENGINE INTAKE AIR FLOW MEASURING APPARATUS

Hiroshi Kobayashi, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Jun. 30, 1982, Ser. No. 393,790
Claims priority, application Japan, Jul. 3, 1981, 56-98571[U]
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—118 **11 Claims**



1. Apparatus for measuring intake air flow into an engine having an intake manifold in which air flow vortices are generated, comprising:
(a) means for measuring the number of vortices, depending on the intake air flow into the engine, during a predetermined crank angle rotation of said engine;
(b) means for sensing the magnitude of fluctuation of the intake air flow;
(c) means responsive to said sensing means for decreasing the measured number of vortices by a predetermined number, when the magnitude of fluctuation of the intake air flow exceeds a predetermined value; and
(d) means for calculating the average intake air flow in accordance with the number of vortices.

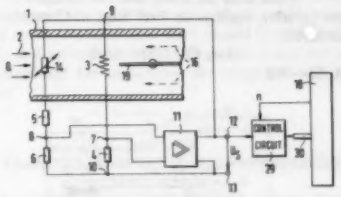
4,457,167

METHOD FOR MEASURING THE PULSATING AIR MASS ASPIRATED BY AN INTERNAL COMBUSTION ENGINE

Jaihind S. Sumal, Vaihingen-Ensingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 14, 1982, Ser. No. 417,972
Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218931
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—118 **8 Claims**

1. A method for measuring the pulsating air mass aspirated by an internal combustion system in a flow cross section by means of a flowthrough measuring device, which furnishes a flowthrough measurement value (U_s) associated with a flowthrough value (Q) of the air mass and for the correction of the flowthrough measurement value (U_s) in the event of reversed flow, comprising the steps of,
ascertaining an upper reference value (U_{or}) in accordance with the rpm (n) of the engine, above which a reversed flow of the air takes place,
comparing the actual flowthrough measurement value (U_s) furnished by the flowthrough measuring device with the upper reference value (U_{or}),
detecting a time period (t_r) to begin upon attainment of the upper reference value (U_{or}) by the actual flowthrough measurement value (U_s), which time period ends whenever the actual flowthrough measurement value (U_s) has again dropped to the upper reference value (U_{or}), and
storing the time period (t_r) for subsequent correction of the flowthrough measurement value (U_s) in the event of a reversed flow.

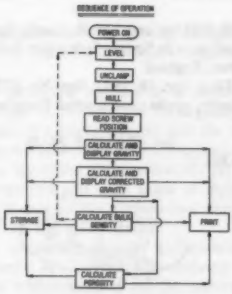


4,457,168

AUTOMATED BOREHOLE GRAVITY METER SYSTEM

Theodore V. Lautzenhiser, and Jimmy D. Wirtz, both of Tulsa, Okla., assignors to Standard Oil Company, Chicago, Ill.

Filed Mar. 10, 1983, Ser. No. 474,064
Int. Cl.³ G01V *7/04;* **G01N** *29/04*
U.S. Cl. 73—151 **14 Claims**



1. A borehole gravity meter control system for operating a borehole gravity meter having gravity sensing means, means for sensing the position of the gravity sensing means and means for adjusting the position of the gravity sensing means in response to the means for sensing; the borehole gravity meter control system comprising:
electronic control circuit means, operatively connected to the means for sensing the position of the gravity sensing means and the means for adjusting the position of the gravity sensing means, for taking an indication of the position of the gravity sensing means and causing the means for adjusting the position of the gravity sensing means to apply mechanical forces to the gravity sensing means until the gravity sensing means is brought to a predetermined position; and
output means for outputting a representation of said mechanical forces applied to the gravity sensing means.

4,457,169

APPARATUS FOR MEASURING THE MASS OF A FLOWING MEDIUM

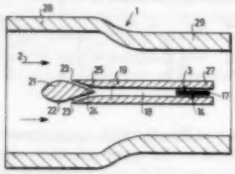
Heinz Lauterbach, Esslingen, and Jörg Widera, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 24, 1982, Ser. No. 382,454

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1981, 3124960

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—202 **5 Claims**



1. An apparatus for measuring mass of a medium flowing through a flow cross section, in particular for measuring an air mass aspirated by an intake tube of an internal combustion engine, provided with means defining a gap having at least one temperature-dependent resistor therein extending parallel to flow of the medium, said air mass serving to regulate selectively a variable characteristic of the temperature-dependent resistor to serve as a standard for said mass of medium, characterized in that a deflecting body having a variable cross-section is disposed upstream of said means defining the gap and the deflecting body defines with said means at least one inlet conduit for said medium to flow into the gap downstream of a maximum cross-section of the deflecting body.

4,457,170

FLUID-GAUGING PROBE ASSEMBLIES AND FLUID TANKS

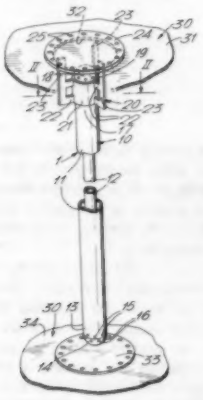
Peter R. Thrift, Oakley, and Neil R. Jacob, Basingstoke, both of England, assignors to Smiths Industries Public Limited Company, London, England

Filed Apr. 28, 1982, Ser. No. 372,764

Claims priority, application United Kingdom, May 19, 1981, 8115283

Int. Cl.³ G01F *23/26*

U.S. Cl. 73—304 C **12 Claims**



1. A fluid-gauging probe assembly for measuring the height of fluid in a reservoir, the assembly comprising an elongate element, and a mount joined with one end of said elongate element, and with a wall of said reservoir to support said elongate element such that it extends within fluid in said reservoir, wherein said mount comprises: a plurality of frangible struts; means fixedly mounting said struts with said elongate element such that they project radially from the elongate element at locations spaced around the elongate element; and means fixedly mounting said struts with the wall of the reservoir so that said elongate element is supported by said struts with said one end of said elongate element spaced from the wall of said reservoir extending across the one end of said elongate member, and wherein the nature of the struts is such that they break when the assembly is subjected to excessive force, thereby allowing the elongate element to be displaced so as to avoid damage to the wall of the reservoir.

4,457,171

LIQUID-LEVEL INDICATOR

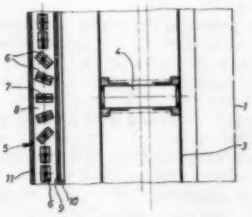
Heinz Gebauer, Ottikon-Gossau, Switzerland, assignor to Transamerica DeLaval, Inc., Princeton, N.J.

Continuation of Ser. No. 286,445, Jul. 24, 1981, abandoned. This application Aug. 30, 1983, Ser. No. 527,509

Claims priority, application Switzerland, Jul. 25, 1980, 5728/80

Int. Cl.³ G01F *23/06*

U.S. Cl. 73—305 **2 Claims**

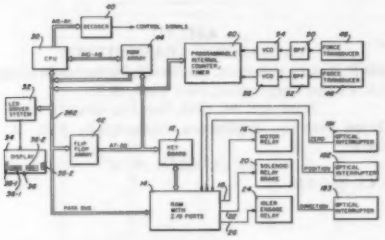


1. An improved liquid-level indicator for a container in which there is provided: an upstanding tube; float means disposed for vertical movement within said tube, said float means including permanent magnet means polarized in a horizontal plane with opposing north and south poles; and display means disposed outside of said tube in the form of a vertical array of a plurality of rotatably supported display elements, said display elements each including permanent magnet means with opposing poles such that in the absence of said float means, said display elements align vertically by reason of the interaction of the adjacent poles of the respective permanent magnet means thereof; said permanent magnet of said float means interacting with the permanent magnets of said display elements for imparting rotation thereto as said float means moves up or down in said tube, characterized in that a vertically extending magnetic strip, horizontally polarized, is disposed between said display elements and said float means for exerting an attractive force on said permanent magnet means of said float means for causing said magnet means of said float means to orient towards said display elements, said magnetic strip additionally exerting a pre-tensioning force on said magnets of said display elements.

4,457,172
ELECTRONIC WHEEL BALANCER WITH SIGNAL CONDITIONING

Ray Mathes, Smyrna, and Mark Van Dyke, Nashville, both of Tenn., assignors to Hofmann Corporation Automotive Service Equipment, Lynchburg, Va.

Filed Aug. 10, 1982, Ser. No. 406,872
Int. Cl.³ G01M *1/22*
U.S. Cl. 73—462 **6 Claims**



1. Apparatus for measuring unbalance in a vehicle wheel, said apparatus comprising:

a drive shaft for carrying the vehicle wheel to be balanced;

means for mounting the wheel to the drive shaft;

transducer means for detecting at least one force indicative of an unbalance condition of the drive shaft;

a voltage controlled oscillator responsive to said signal generated by said transducer means;

a counter responsive to the output of said voltage controlled oscillator;

means for sampling the counter at two points in time separated from each other by a predetermined time period;

means for subtracting the two samples to determine the number of counts per predetermined time period;

means for finding the coarse zero crossing points of the function resulting from the subtraction;

means for interpolating between the coarse zero crossing points to determine the precise time of zero crossing;

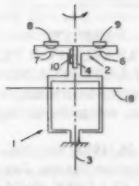
sampling means for sampling the counter at the precise zero crossing time and said predetermined time period away; and

means for subtracting these two counter readings in order to provide the peak value of the transducer means.

4,457,173
MULTIFUNCTION SENSOR USING THIN FILM TRANSISTOR TRANSDUCERS

Joe S. Hunter, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 3, 1982, Ser. No. 373,922
Int. Cl.³ G01P *15/14, 15/08*
U.S. Cl. 73—510 **5 Claims**

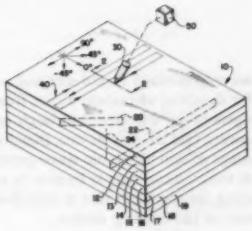


1. A rotating body which rotates at a high speed about a first axis, the improvement comprising a first flexible joint mounted on said body in a first plane orthogonal to said first axis whereby acceleration of said body will cause said flexible joint to flex; a first transducer mounted in said flexible joint so as to detect at its output the amount of strain in said flexible joint caused by said acceleration; first measurement means connected to said first transducer for measuring said acceleration; a second flexible joint mounted on said body in a second plane which is orthogonal to said first plane; a second transducer connected to said second joint so as to detect at its output the amount of strain in said second joint caused by acceleration of said body; and second measurement means connected to said second transducer for measuring the output of said second transducer.

4,457,174
ULTRASONIC INSPECTION OF COMPOSITE MATERIALS

Yoseph Bar-Cohen, Dayton, and Robert L. Crane, Kettering, both of Ohio, assignors to Systems Research Laboratories Inc., Dayton, Ohio and The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 10, 1982, Ser. No. 376,891
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—598 **13 Claims**



1. Method of ultrasonically inspecting composite materials having a plurality of fiber reinforced plys comprising the steps of:

positioning an ultrasonic transmitter in acoustical contact with one surface of the material undergoing test and directing a beam of acoustic energy into the material with the axis of the beam orientated at a preselected angle with respect to the lay of the fibers within the ply of the material being inspected and with angle of incidence of the beam with respect to the surface less than the second critical angle for the material, and

positioning an ultrasonic receiver in acoustical coupling with the material at a location for receiving the reflected energy from within the ply of the material being inspected.

4,457,175
INSONIFICATION APPARATUS FOR AN ULTRASOUND TRANSMISSION SYSTEM

S. David Ramsey, Jr., and Jon C. Taenzer, both of Palo Alto, Calif., assignors to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Filed May 17, 1982, Ser. No. 378,858
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—606 **13 Claims**

1. An insonification apparatus for an ultrasound transmission system, said system being determined for the examination of an object, comprising in combination:

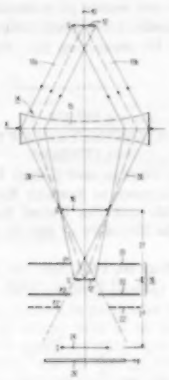
(a) an ultrasonic wave-generating transducer for emitting ultrasonic waves;

(b) an examination plane containing a plane of said object under examination, said examination plane receiving ultra-

sonic waves from said ultrasonic wave-generating transducer;

(c) an imaging device having an aperture of predetermined width for passing ultrasound therethrough, said imaging device receiving ultrasonic waves from said examination plane; and

(d) an ultrasound condensing device positioned between said



ultrasonic wave-generating transducer and said examination plane for directing ultrasonic waves from said ultrasonic wave-generating transducer through said examination plane toward said imaging device, thereby forming an ultrasonic image of said ultrasonic wave-generating transducer which transducer image is located in said aperture of said imaging device, such that it completely fills the entire aperture of the imaging device.

4,457,176

NON-DESTRUCTIVE METHOD AND DEVICE FOR ULTRASONIC TESTING OF THE MATERIAL OF GENERATOR ROTOR TEETH

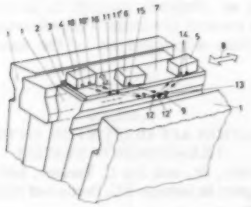
Arthur Scholz, Wettingen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed May 25, 1982, Ser. No. 381,832

Claims priority, application Switzerland, Jun. 11, 1981, 3823/81

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—624 **5 Claims**



1. A process for the non-destructive ultrasonic testing of the material of generator rotor teeth provided with an inserted slot wedge, using at least one transmit probe and at least one receive probe, each rotor tooth having first and second opposed flanks, comprising:

radiating and directing an ultrasonic beam by means of the transmit probe such that the beam is firstly reflected at one tooth flank and then at the opposite flank of the same rotor tooth;

receiving and signalling the acoustic beam reflected from the opposite tooth flank by means of a reference probe;

placing a defect detecting probe outside the range of reception of the normally reflected ultrasonic beam in the absence of a defect;

receiving an ultrasonic beam reflected by any existing defects by means of said defect detection probe; and

detecting location on any defect based on signals received by the reference probe and the defect detection probe.

4,457,177

ULTRASONIC TRANSMITTER

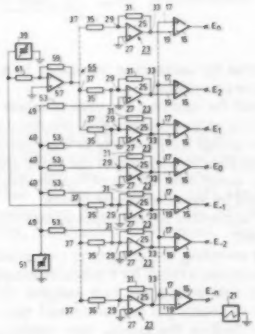
Teunis R. Van Heelsbergen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 24, 1983, Ser. No. 460,321

Claims priority, application Netherlands, Feb. 9, 1982, 8200478

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—626 **8 Claims**



1. An ultrasonic transmitter comprising:

a plurality of oscillator circuits, each oscillator circuit having a start input and an output;

a like plurality of electro-acoustic transducers, each transducer being connected to the output of a corresponding oscillator for activation thereby;

a like plurality of comparators, each comparator having a first input, a second input, and an output; the output of each comparator being connected to the start input of a corresponding oscillator;

generator means for producing a saw-tooth voltage at an output which is connected to the first inputs of all of the comparators; and

voltage source means which supply controllable DC voltages to the second input of each of the comparators, the DC voltages supplied to each of one or more groups of at least two of the comparators being controllable by a common control.

4,457,178

PROCESS AND APPARATUS FOR TESTING OF RAILS BY ULTRASOUND

Jean-Pierre Turbe, Nantevil-les-Meaux, and Bruno Meignan, Esbly, both of France, assignors to Matix Industries, Inc., France

Filed Mar. 26, 1982, Ser. No. 362,264

Claims priority, application France, Jun. 23, 1981, 81 12334

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—636 **13 Claims**

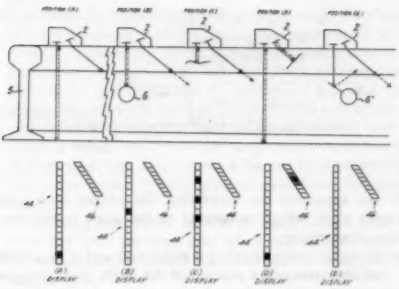
1. A method for ultrasonic testing of a body comprising the steps of:

repetitively emitting a first ultrasonic beam into said body in a first direction;

repetitively emitting a second ultrasonic beam alternate with said first ultrasonic beam into said body in a second direction coplanar with said first direction at a predetermined angle thereto;

receiving echoes of said first ultrasonic beam;

displaying said received echoes of said first ultrasonic beam



on a first linear display component oriented in a direction corresponding to said first direction;

receiving echoes of said second ultrasonic beam; and

displaying said received echoes of said second ultrasonic beam on a second linear display component oriented at substantially at predetermined angle with respect to said first linear display.

4,457,179

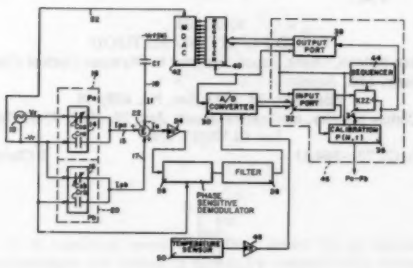
DIFFERENTIAL PRESSURE MEASURING SYSTEM

Frank J. Antonazzi, and Joseph A. Bluish, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 16, 1981, Ser. No. 244,184

Int. Cl.³ G01L *9/12*

U.S. Cl. 73—701 **11 Claims**



1. A differential pressure measuring system comprising:

means for generating first and second alternating reference signals having a predetermined phase relationship therebetween;

a first pressure sensitive impedance, responsive to a first pressure, driven by said first reference signal for generating a signal proportional to the change in the first pressure;

a second pressure sensitive impedance, responsive to a second pressure, driven by said second reference signal for generating a signal proportional to the change in the second pressure;

means, electrically connected to said first and second impedances, for generating an analog error signal which is proportional to the difference between said first and second pressures;

means for converting said analog error signal into a digital error signal;

means for integrating said digital error signal and generating a digital output number N therefrom;

means for converting said digital output number into an alternating feedback signal of the same phase as one of said reference signals; wherein said feedback signal is fed back to said analog error signal generating means through a feedback impedance to null said analog error signal; and

said digital output number N being representative of the difference in said first and second pressures when the digital error is nulled.

4,457,180

PRESSURE MEASURING DEVICE

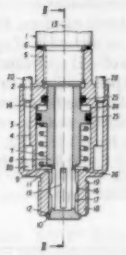
Helmut List; Peter Claassen, and Rudolf Zeiringer, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Jun. 9, 1982, Ser. No. 386,652

Claims priority, application Austria, Jun. 15, 1981, 2668/81

Int. Cl.³ G01L *19/00*

U.S. Cl. 73—756 **3 Claims**



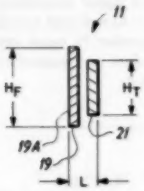
1. A pressure measuring device comprising a pressure sensor, a change-over valve and a connecting channel which connects said sensor and said valve, said valve having two switch positions and connecting said channel to the point where the pressure is to be measured in its first position and to a pressure pipe serving as a reference standard in its second position, said change-over valve having a spring-loaded double valve actuated by a separate control pressure medium and comprising a housing having a guide bore, a steering piston axially movable along said bore, said bore extending from an end of said device adjacent a measuring site to an end thereof adapted for holding said sensor, said piston being loaded by a valve spring and having a pair of sealing surfaces spaced apart axially in the direction of piston movement, said housing having inner and outer valve seats spaced apart axially in the direction of piston movement, said sealing surfaces respectively cooperating with said valve seats, said sealing surface being axially spaced apart a distance greater than that of said valve seats, said steering piston having an axial blind bore extending from an end thereof adjacent said sensor and forming part of said connecting channel, said piston having openings extending between said sealing surfaces from said blind bore and outwardly of said piston, wherein said outer valve seat lies adjacent the measuring site, and is closed due to the action of said valve spring in said second valve position while said inner valve seat remains open, and wherein said piston and said guide bore in said housing form a working chamber to which pressure may be applied via said control pressure medium against the force of said valve spring for changing over to said first valve position in which said outer valve seat is opened and said inner valve seat is closed.

4,457,181

NARROW PROFILE VORTEX SHEDDING BODY

David W. Marsh, Pawtucket, R.I., assignor to The Foxboro Company, Foxboro, Mass.

Filed Apr. 5, 1982, Ser. No. 365,679
Int. Cl.³ G01F 1/32
U.S. Cl. 73—861.22 19 Claims



1. A narrow-profile body for shedding vortices within a fluid flowing through a conduit of inside diameter D, comprising:

an upstream elongate member spanning the interior of said conduit, having an upstream-facing surface aligned normal to the flow direction, said surface having a width H_F as measured perpendicular to its direction of span; and

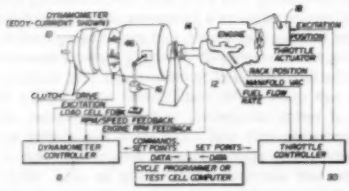
a downstream elongate member, also spanning the interior of said conduit, its direction of span being parallel to the direction of span of said upstream member, having a width H_T, as measured perpendicular to its direction of span, and an extension L along the flow direction, as measured from said upstream-facing surface, the ratio H_F/H_T being within the range from 1.0 to 2.2, the ratio H_F/D being in the range from 0.1 to 0.3, and the ratio L/H_F being less than 0.4.

4,457,182

THROTTLE CONTROLLER FOR ENGINES IN DYNAMOMETER TESTING

Robert A. McFarland, 640 Sunvale, Ventura, Calif. 93003

Filed May 17, 1982, Ser. No. 378,818
Int. Cl.³ G01L 3/22; G01M 15/00
U.S. Cl. 73—862.18 10 Claims



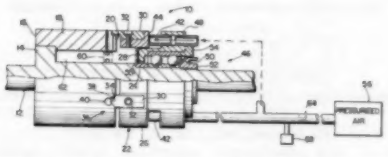
1. In a throttle controller for an engine being tested on a dynamometer, the improvement comprising a circuit comprising means to control the throttle of said engine in accordance with a mode in accordance with one of dynamometer load or engine speed in a closed loop fashion, said dynamometer including a controller, said dynamometer controller operating in one of said dynamometer load and engine speed modes to control said dynamometer, and said circuit means controlling said engine's throttle using the other of said dynamometer load or engine speed mode not being used by said dynamometer controller.

4,457,183

TORQUE MEASURING DEVICE

Carl M. Westbrook, 1475 Gunlock Shores La., Minocqua, Wis. 54548

Filed Apr. 15, 1982, Ser. No. 368,685
Int. Cl.³ G01L 3/04
U.S. Cl. 73—862.32 14 Claims



1. An apparatus for measuring the torque on a rotating elongate shaft which is twisted as the shaft is subjected to torque comprising:

an elongate tubing having a distal end and a proximal end which surrounds a portion of the shaft, said tubing being secured to the shaft so that a portion of said tubing adjacent to said proximal end is freely located about the shaft;

a flange member located adjacent the proximal end of said tubing having a central hub connected to the shaft, an outer rim, and a flexible connecting means for connecting said rim to said hub;

cam means interconnecting said rim of said flange member and said proximal end of said tubing for deflecting said rim axially of said hub relative to the force exerted by said flexible connecting means when the shaft is twisted by torque;

and

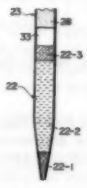
a torque determining means which is stationary with respect to the rotation of the shaft for measuring the axial deflection of said rim against the force of said flexible connecting means caused by the twisting of the shaft whereby the torque is determined by the magnitude of the deflection of said rim.

4,457,184

FLUID PIPETTING METHOD

Kazuo Shiono, Oume, Japan, assignor to Olympus Optical Company, Ltd., Japan

Filed Jan. 20, 1983, Ser. No. 459,648
Claims priority, application Japan, Jan. 29, 1982, 57-11774
Int. Cl.³ B01L 3/02
U.S. Cl. 73—864.11 5 Claims



1. A method for pipetting and distributing each of a plurality of test fluids into a plurality of vessels by means of a common pipetting apparatus, the method comprising the steps of:

(A) cleaning the inner and outer walls of a probe provided in the pipetting apparatus by means of a cleaning liquid at a cleaning station of said apparatus;

(B) placing cleaning liquid within said probe and a fluid line communicating therewith;

(C) drawing air into said probe while transferring said probe to a station for picking up said fluid so as to define an air layer in said probe;

(D) drawing test fluid into said probe while said probe is immersed in a reservoir of test fluid in such a manner that said test fluid drawn into said probe is separated from said cleaning liquid in said probe through said air layer;

(E) discharging a part of said test fluid from said probe after said probe has been withdrawn from the surface of said reservoir of test fluid but before said probe reaches a first fluid pipetting station at which one of said vessels is located;

(F) successively transferring said probe to each of a plurality of fluid pipetting stations corresponding to each of said vessels, respectively, and pipetting a varying amount of fluid from said probe into each said vessel, said fluid being defined by test fluid and an amount of cleaning liquid which migrates into said test fluid while in said probe, the amount of fluid pipetted varying in accordance with the order in which said probe is transferred to said pipetting stations such that the amount of the test fluid pipetted into respective vessels is maintained at a substantially constant value;

(G) returning said probe to said cleaning station after said fluid has been pipetted into all of said vessels and then discharging any test fluid which remains in said probe; and thereafter

(H) repeating steps (A) through (G) for each of said plurality of test fluids.

4,457,185

ROTATIONAL SPEED CONTROLLING DEVICE FOR AUTOMATIC TRANSMISSIONS USING SLIDING ENGAGEMENT PIECE

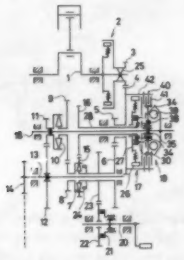
Hitoshi Yoshida, Kamimura, and Seiichi Suzuki, Shizuoka, both of Japan, assignors to Suzuki Motor Company Limited, Japan

Filed Jul. 29, 1981, Ser. No. 288,176

Claims priority, application Japan, Aug. 8, 1980, 55-108273; Oct. 28, 1980, 55-151024

Int. Cl.³ F16H 5/52

U.S. Cl. 74—336 R **3 Claims**



1. A rotational speed controlling device for an automatic transmission for changing speeds by automatically changing over between a plurality of centrifugal clutches in response to the number of revolutions of an engine connected to the transmission, characterized in that a sliding piece is connected to a rotary shaft to which the rotation of a low speed side centrifugal clutch is to be transmitted so as to be able to transmit rotations and to be slidable in the axial direction in response to a driving torque of the engine so that the number of engaging rotations of a high speed side centrifugal clutch may be varied by the sliding of the above mentioned sliding piece caused in response to the driving torque, and in that the above mentioned sliding piece is connected through dogteeth to a hub of the above mentioned low speed side centrifugal clutch, said sliding piece being connected through a helical spline to the rotary shaft to which the rotation of the hub of the above mentioned low speed side centrifugal clutch is to be transmitted, the above mentioned high speed side centrifugal clutch being formed as a centrifugal ball type clutch, a further hub of said high speed side centrifugal clutch being connected through a spline to a further rotary shaft to which the rotation of said further hub is to be transmitted so that the further hub of the above mentioned high speed side centrifugal clutch may be pressed and slid by the sliding of the above mentioned sliding piece.

4,457,186

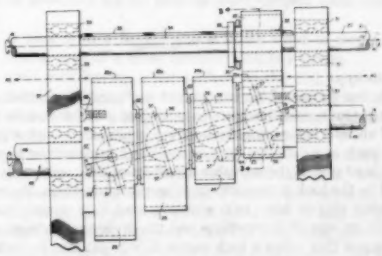
POWER TRANSMISSION DEVICE

John C. Brozovich, 1795 W. 4805 South, and John P. Brozovich, 4940 S. 2200 West, both of Salt Lake City, Utah 84118

Filed Jul. 16, 1982, Ser. No. 398,867

Int. Cl.³ F16H 3/22, 1/12

U.S. Cl. 74—348 **17 Claims**



1. A device for providing positive geared, constant mesh, variable speed, rotary power transmission, said device comprising:

a substantially straight, power drive shaft adapted with means at one end for coupling to an external power source or load and configured to provide an axial track guide for an axially sliding gear;

a drive gear coaxially mounted on the power drive shaft and adapted for sliding movement along the longitudinal axis of said shaft;

means for locking said sliding drive gear in axial rotation with the drive shaft;

a substantially straight transmission drive shaft adapted with means at one end for coupling to an external load or power source and having a fixed, oblique orientation with respect to said power drive shaft;

a plurality of reduction gears;

means for mounting said reduction gears substantially parallel to said power driven shaft on said straight driven shaft, each of said reduction gears having a central opening configured to house the gear mounting means and to enable oblique mounting thereof on said transmission drive shaft during 360° of rotation, said opening including at least one elongated recess having a direction in substantial alignment with the transmission drive shaft, said recess being configured with sufficient axial length to permit movement of a transmission rotational locking means from a forward to rearward position within said recess during 360° rotation of said reduction gear; and

transmission rotational locking means fixed to the transmission drive shaft within the central opening of the reduction gear, said rotational locking means including at least one locking segment projecting radially into the recess from the transmission drive shaft and being configured to transfer rotational motion between the reduction gear and transmission drive shaft during 360° movement.

4,457,187

BURGLARPROOF APPARATUS FOR INTERNAL COMBUSTION ENGINE

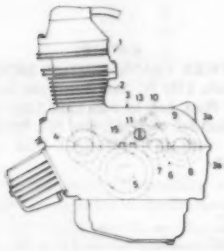
Masaharu Tsuboi, Sayama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1980, Ser. No. 214,649

Claims priority, application Japan, Dec. 12, 1979, 54-160264; Dec. 13, 1979, 54-160857

Int. Cl.³ F02B 77/00; F16M 1/00; F16H 57/10; B60R 25/06

U.S. Cl. 74—411.5 10 Claims



1. A burglarproof apparatus for an internal combustion engine characterized in that a case such as a crank case or the like of an internal combustion engine is provided with a lock means such as a cylinder lock or the like operable by a key so that at least one of the movable members of the engine may be locked by the lock means into its inoperable condition, the case is divided into at least two sections, said lock means being mounted on one of the sections and the divisional sections are so arranged that when a lock means is brought into its locked position, they are locked together inseparably by the lock means directly engaging a portion of the other section.

4,457,188

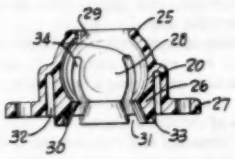
SHIFT LEVER MOUNTING ASSEMBLY

Hans Hauser, Chippewa Lake, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Filed Oct. 8, 1981, Ser. No. 309,599

Int. Cl.³ B60K 20/00; F16C 11/06

U.S. Cl. 74—473 P 2 Claims



1. A mounting housing for accommodating the shift ball mounted on a shift lever, said mounting housing having an upper portion and a lower portion, said mounting housing having a cavity to accommodate said shift ball, each of said portions having an opening extending therethrough into said cavity, said opening of said upper portion having a cross-sectional area sufficient in size to permit the shift lever to extend therethrough and to wobble angularly relative to the axis of said opening and so limited in cross-sectional area as to bar passage of the shift ball upwardly through said opening, said opening of said lower portion having a cross-sectional area sufficient in size to permit the shift lever to extend therethrough and to wobble angularly relative to the axis of said opening and so limited as to bar passage of said shift ball therethrough in the normal position of said lower portion around said opening, said shift ball having pins extending radially outward therefrom, said mounting housing having guiding grooves extending outwardly therein from said cavity to accommodate said pins, respectively, and to permit movement of said pins in said grooves upon rotation of the shift ball by wobbling the shift stick to tilt the same, said grooves extending longitudinally through said lower portion to said upper portion for permitting the pins to be moved upwardly into said grooves, said grooves opening into said cavity accommodating said shift ball, said lower portion of said mounting housing being of resiliently yieldable material having an annular slot disposed around, and spaced radially outward of, said opening in said lower portion to permit the material around said opening of said lower portion to flex into said annular slot and spring back from said normal position sufficiently to permit the shift ball to enter through said opening in said lower portion into said cavity to be held therein upon the said material around said opening in said lower portion resuming its normal position, said mounting housing being attached over a hole in a transmission housing with the lower end of the shift lever extending through the hole and the peripheral edge portion of the hole through the transmission housing engaging the confining said lower portion to prevent significant flexing of the material around said opening of said lower portion and thus keeping the material around said opening in said lower portion at the normal position, the arrangement capturing the shift ball in said cavity.

4,457,189

LINKAGE FOR OPERATING A CONTROL ELEMENT OF AN INTERNAL COMBUSTION ENGINE

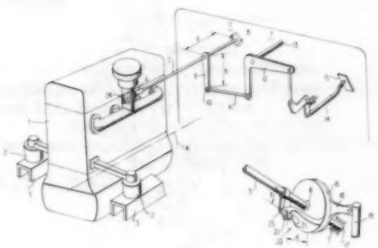
Dieter Papenhagen, Backnang-Heiningen; Henning Wallentowitz, Aichwald; Gerhard Lepler, Wolfschlugen, and Martin Hampp, Nagold, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 17, 1981, Ser. No. 293,504

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1980, 3031035

Int. Cl.³ G05G 1/14

U.S. Cl. 74—513 5 Claims



1. A linkage assembly for operating a control element of an internal combustion engine that is resiliently mounted with respect to a body of an automobile so as to incline under load about a longitudinal axis of the automobile comprising

a longitudinal shaft installed in parallel to said longitudinal axis of the automobile, said shaft being mounted above said longitudinal axis, with one end connected to the internal combustion engine and an opposite end connected to the body of the automobile by a bearing, in a rotatable and pivotable fashion, and

a regulating lever operated by an operating member, said regulating lever being fixedly connected at one end of the longitudinal shaft and articulated to a linkage leading to an operating member at a second end,

wherein the connection of the regulating lever to the longitudinal shaft is spaced a first predetermined distance with respect to said bearing;

and the regulating lever has a length defining a second predetermined distance measured by the length between the second end of the regulating lever and the longitudinal shaft;

and that the second end of the regulating lever, when the operating member is stationary, is held laterally immovably below the longitudinal shaft;

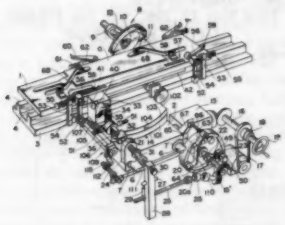
and the first predetermined distance and said second predetermined distance from the articulation of the second end of the regulating lever to the longitudinal shaft are dimensioned whereby, with an inclination of the internal combustion engine about the longitudinal axis of the automobile by a certain angle, the regulating lever executes a pivoting motion about the articulation by an approximately equal angle, so that a control element of the engine which is actuated by the longitudinal shaft is essentially always at a desired positional relationship with respect to the engine.

4,457,190

METHOD AND APPARATUS FOR PROFILE-FORMING SAW TEETH

Taro Nanba, Sanjo, Japan, assignor to Yugenkaisha Nakaya Nokogirikikai Seisakusho, Niigata, Japan

Filed May 26, 1982, Ser. No. 382,179
Claims priority, application Japan, May 29, 1981, 56-82385
Int. Cl.³ B23D *63/12*
U.S. Cl. 76—43 **3 Claims**



1. In the method of forming saw teeth in a saw blade which is mounted on a carriage in confronting relation to a rotatable cutter member wherein a pattern is formed on said carriage of the teeth to be cut in said saw blade, an edge portion to be toothed on said saw blade is advanced with said carriage in confronting relation to said rotatable cutter member, said carriage is advanced into the path of rotation of said cutter at a predetermined angle of approach to form a first tooth therein followed by successively releasing a locking member on said carriage and longitudinally advancing said carriage a predetermined distance until said saw blade is aligned for cutting of each next tooth in succession and, in succession, said carriage is again advanced into the path of rotation of said cutter to form each tooth in succession, the improvement comprising:

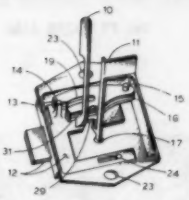
thereafter repeating the steps of releasing said locking member, longitudinally advancing said carriage for a predetermined distance, positioning said locking member in locking relation to a tooth to be formed on said pattern and transversely advancing said carriage to form each next tooth in succession, and gradually increasing said angle of approach in correlation with the longitudinal and transverse movement of said carriage between the formation of each successive tooth.

4,457,191

LEVER TUMBLER LOCK PICK SET

William R. Weber, 4200-50th Ave., NE., Seattle, Wash. 98105

Filed May 29, 1981, Ser. No. 268,360
Int. Cl.³ E05B *19/20*; B25B *27/00*
U.S. Cl. 81—3 R **1 Claim**



1. A lock pick set for picking lever tumbler locks comprising:

a. a pick with a handle and a shank sized to work in the throat area of a lever tumbler lock key guide;

b. said pick having a flat surface on the end, opposite said handle, said surface being generally parallel to the pick shank and of a length equal to the combined thickness of the lever tumblers of a lock to be picked;

c. a tension wrench with a handle and a shank to work in the lock key guide, in conjunction with said pick, with a tip opposite the handle end and a protrusion, adjacent to the tip, sized and situated to contact a bolt of said lock;

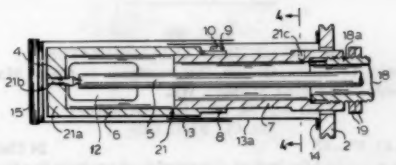
d. said pick being adapted to lift the lever tumblers on their common surface to allow a bolt stop to enter lever tumbler gates as the rotating tension wrench protrusion, stabilized by the tip, forces the bolt to an unlocked position.

4,457,192

ATTACHMENT TO TRANSFORM A MECHANICAL INTO A SHAFT LATHE

Eugenio Eibenschutz, Fresas No. 102, Depto. 602, Mexico, D.F., Mexico

Filed Apr. 8, 1982, Ser. No. 366,774
Claims priority, application Mexico, Jun. 18, 1981, 187863
Int. Cl.³ B23B *13/00*
U.S. Cl. 82—2 R **6 Claims**



1. In a lathe comprising a lathe bed, a tailstock mounted on the lathe bed at one end thereof, the tailstock carrying a dead center, and a headstock mounted on the lathe bed at a distance from the tailstock at an opposite end thereof, the distance defining the length of the lathe bed, and a hollow spindle being rotatably journaled in the headstock: an attachment for the hollow spindle, the attachment extending from the headstock in a direction away from the tailstock, the attachment being of adjustable length and having an end spaced from the headstock and defining a tapered borehole, the spindle or the borehole at the end of the attachment selectively holding a live center in alignment with the dead center, the centers being capable of supporting therebetween a workpiece shaft having a length exceeding the length of the lathe bed.

4,457,193

MACHINE-TOOL COMPRISING TWO OPPOSED COAXIAL SPINDLES

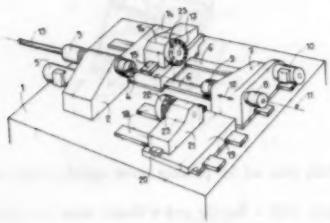
Maurice Matthey, Versoix, Switzerland, assignor to Tarex Machines S.A., Geneva, Switzerland

Filed Jul. 15, 1981, Ser. No. 283,545

Claims priority, application Switzerland, Jul. 16, 1980, 5445/80

Int. Cl.³ B23B *3/30*

U.S. Cl. 82—3 **2 Claims**



1. A machine tool including a pair of spindles mounted in headstocks on a common base and means for rotating each about a common axis, a slideway, at least one of said headstocks being movable along said slideway on said base and means to move said headstock between positions toward and away from said other spindle and supporting at least one workpiece selectively in one, either, or both of said spindles; a pair of rotatable tool carrying indexable tool turrets, one rotatably mounted about an axis on each side of said common axis for said spindles and parallel thereto, each turret including a carriage, a slideway and means for moving said carriage along a path parallel to said common axis, and wherein one of said turret slideways is in common with said headstock slideway, each turret further including a turret frame mounted on said carriage and means for moving said turret frame transverse to said slideway and said carriage to selectively position one or more tools carried by said turrets into selective engagement with a workpiece carried by either or both of said spindles to perform predetermined machining operations thereon, at least one of said turrets including first and second faces with means defining tool supporting openings extending therebetween and configured to receive and support on either or both faces a tool element for selective engagement with said workpiece.

4,457,194

SLICING METHOD AND APPARATUS

Timothy G. Mally, Oregon, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Sep. 28, 1981, Ser. No. 306,417

Int. Cl.³ B26D *3/00*

U.S. Cl. 83—42 **24 Claims**

16. A method for feeding elongated food products to a slicer, wherein the method comprises the steps of:

placing an elongated food product on an elongated product support in an apparatus having a pair of product engaging members which are movable parallel to the product support and are movable into and out of registration with the product support, the slicer being adjacent one end of the product support;

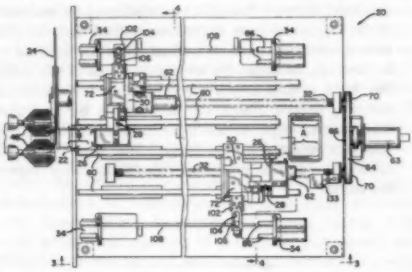
moving the first product engaging member through a path that is generally parallel to the elongated product support and into registration with the product support to engage the food product, the second product engaging member being moved out of registration with the product support;

moving the first product engaging member toward the slicer to feed the food product to the slicer while simultaneously moving the second product engaging member away from the slicer, until the food product is substantially sliced;

moving the first product engaging member out of registration with the product support;

p'acing a second elongated food product on the product support;

moving the second product engaging member through a path that is generally parallel to the elongated product



support and into registration with the product support to engage the second food product;

moving the second product engaging member toward the slicer to feed the second food product to the slicer while simultaneously moving the first product engaging members away from the slicer, until the second food product is substantially sliced.

4,457,195

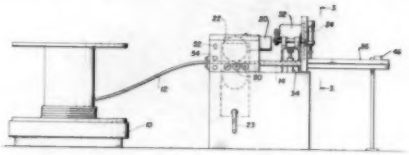
AUTOMATIC STRIP CUTTING MACHINE

Dannie L. Brooks, Red Lion, Pa., assignor to Reel-O-Matic Systems, Inc., Wrightsville, Pa.

Filed May 17, 1982, Ser. No. 378,949

Int. Cl.³ B23D *45/04*

U.S. Cl. 83—69 **5 Claims**



1. A machine for cutting desired lengths of a material and depositing the cut length into a container which comprises:

a motor driven tensioned controlled payoff turntable for mounting a reel of material to be cut and for feeding the material off the turntable at a desired feed rate;

a material feeder roller means including adjacent cooperating rollers between which said material to be cut is fed;

guide means between said motor driven tensioned control payoff turntable and said material feeder roller means for guiding said material between said cooperating rollers;

a cutter - motor assembly downstream of said material feeder roller means for cutting said material into desired lengths;

a V-trough table means adjacent said cutter - motor assembly for receiving said material from said material feeder roller means prior to being cut into desired lengths;

said V-trough being hinged to said table for opening subsequent to a desired length of material being cut in order to drop said cut piece into a container below said table;

means for determining a desired length of material to be cut, and first control means for moving said cutter motor assembly vertically for cutting said material into a desired length,

a second control means for opening said V-trough to drop said cut piece of material from said V-trough to a container below said V-trough; and

control means for operating said motor driven tensioned controlled payoff turntable, said cooperating rollers, said cutter-motor assembly and said first and second control means.

4,457,196

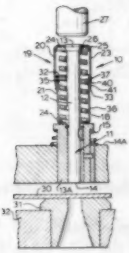
PUNCH PRESS ASSEMBLY INCLUDING A PRELOADED ENCAPSULTED SPRING

Percy L. Cady, Attica, N.Y., assignor to Houdaille Industries, Inc., Ft. Lauderdale, Fla.

Continuation-in-part of Ser. No. 216,631, Dec. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 106,832, Dec. 26, 1979, abandoned. This application Nov. 10, 1982, Ser. No. 440,551

Int. Cl.³ B26F *1/14*

U.S. Cl. 83—140 **32 Claims**



1. Improved apparatus for use in a punch press assembly comprising a punch rod supported for reciprocable movement in an interlocked spring assembly and stripper guide, said spring assembly comprising first and second housing halves each having a circumferential peripheral wall, a partially closed bottom wall, and an open end spaced by the peripheral wall from the bottom wall, the first housing half having its open end telescopically received interior of the open end of the second housing half for encapsulating and pre-loading a spring positioned interior of the housing halves for urging the housing halves in an axial direction away from one another, the housing halves having circumferential engaging surfaces adjacent their open ends limiting axial movement of the housing halves away from the one another but allowing movement of the housing halves in the direction towards one another, the bottom wall of one housing half containing means for supporting an upper free end of the punch rod and the other housing half bottom wall having a central aperture through which the punch rod extends, said other housing half bottom wall and an upper surface of said stripper guide having mating interlock means for joining together the spring assembly and stripper guide, and the stripper guide having a central passage coaxial with the central aperture for receiving a lower free end of the punch rod therethrough.

4,457,197

DEVICE FOR CUTTING AND/OR STAMPING METAL BARS AND SECTIONS

Joachim Wepner, Gevelsberg; Hubert Barysch, Ennepetal, and Erwin Kruse, Gevelsberg, all of Fed. Rep. of Germany, assignors to Rolf Peddinghaus, Ennepetal, Fed. Rep. of Germany

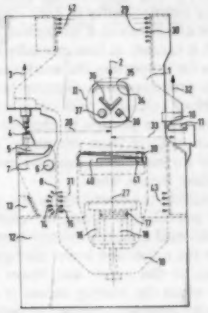
Filed Feb. 23, 1982, Ser. No. 351,593

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1981, 3107199

Int. Cl.³ B23D *23/00*

U.S. Cl. 83—197 **5 Claims**

1. A device for stamping metal bars and sections comprising a machine frame adapted to support one tool of a pair of tools, a slide guided in said frame driven in the direction of its length and adapted to carry the other tool of said pair of tools, a hydraulic drive means operatively connected to said slide to apply driving force substantially in the longitudinal center line of the slide, said pair of tools being laterally offset relative to the effective line of application of the driving force, laterally spaced guides on the machine frame above and below said tools for guiding the movement of said slide, and means to



apply an additional force to the slide to oppose the torque moment generated by the force couple formed by the driving force and the stamping reaction force developed in use by said pair of tools comprising, a rocker member hinged to the machine frame and having a side which is adapted to serve as a guide face abutting the slide, and a saddle mounted on said rocker member, said one tool of the pair of tools being mounted on said saddle.

4,457,198

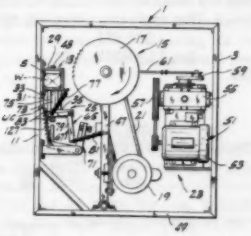
APPARATUS FOR CUTTING LENGTHS OF LUMBER INTO BLOCKS

Larry L. Price, Rte. 2, Van Buren, Mo. 63965

Filed Feb. 12, 1982, Ser. No. 348,348

Int. Cl.³ B26D *7/06*

U.S. Cl. 83—411 A **14 Claims**



1. Apparatus for cutting elongate workpieces, such as lengths of lumber, into blocks of predetermined length, said apparatus comprising:

a chute for holding a workpiece generally vertical comprising separate upper and lower portions, the top of the lower chute portion being spaced below the bottom of the upper chute portion to form a gap therebetween;

cutting means adapted to cut the workpiece in a generally horizontal cutting plane;

means for moving the cutting means between a cutting position in which it extends into said gap between the chute positions for cutting the workpiece and a retracted position in which it is spaced from said gap between the chute portions; said means for moving the cutting means comprising an arm

mounted for pivotal movement about a generally vertical axis, the arm carrying the cutting means adjacent the free end thereof, and means for pivoting the arm and

means for feeding the workpiece through the chute under the force of gravity in timed relation to the movement of the cutting means between its cutting and retracted positions, the feed means comprising:

upper and lower clamp means for releasably clamping the workpiece in the upper and lower chute portions, respectively, said upper and lower clamp means being adapted for movement independently of each other,

stop means movable between a workpiece supporting position in which it extends at least partially across the lower chute portion for supporting the workpiece with its lower end spaced a predetermined distance below the cutting plane and a block releasing position in which it is spaced from the lower chute portion to enable a block cut from the workpiece to drop from the chute, said stop means being adapted for movement independently of the upper and lower clamp means, and

means for controlling the operation of the upper and lower clamp means and the stop means, the control means being associated with said arm, the control means being operable to actuate the upper and lower clamp means to clamp the workpiece in the upper and lower chute portions, respectively, when the cutting means is moved from its retracted to its cutting position; to actuate the upper clamp means to clamp the workpiece in the upper chute portion, to position the stop means in its block releasing position, and to actuate the lower clamp means to release the block cut from the workpiece and allow the block to drop from the chute when the cutting of the workpiece has been completed; and to position the stop means in its workpiece supporting position, and to actuate the upper and lower clamp means to release the workpiece to allow it to drop into bearing engagement with the stop means for being supported for the next cutting operation when the cutting means is in its retracted position.

4,457,199

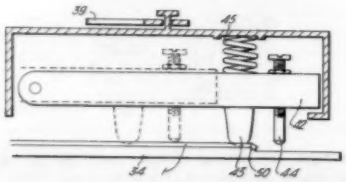
METHOD FOR CUTTING SLITS IN FLEXIBLE PLASTICS SHEETING

Sean Corcoran, 34, Clarinda Park West, Dun Laoghaire, County Dublin, Ireland

Continuation-in-part of Ser. No. 685,888, May 12, 1976, abandoned, which is a continuation of Ser. No. 479,133, Jun. 13, 1974, abandoned. This application Nov. 13, 1980, Ser. No. 206,658

Int. Cl.³ B26D *3/08*

U.S. Cl. 83—862 **8 Claims**



1. In the manufacture of a selectable width window blind, a method of cutting a series of substantially invisible spaced-apart continuous linear slits in a sheet of flexible plastics window blind material, said method comprising supporting a portion of the sheet on support means with one surface of the sheet contacting said support means, contacting the opposite surface of the sheet with a plurality of cutting elements which are biased towards the support means and each has a thickness which is small enough to cut a substantially invisible slit in the sheet, controlling the biasing of the cutting elements such that the cutting elements penetrate into the sheet to a depth which is less than the thickness of the sheet, effecting relative movement between the sheet and said cutting elements to form substantially invisible slits in said sheet, and forming a plurality of tabs at an edge of said sheet, said tabs being positioned with respect to said substantially invisible slits to provide an indication of the location of the slits.

4,457,200

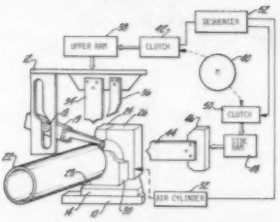
METHOD FOR CUTTING HEAVY WALL TUBE

John J. Borzym, Birmingham, Mich., assignor to Alpha Industries Inc., Novi, Mich.

Filed Sep. 23, 1982, Ser. No. 422,233

Int. Cl.³ B26D *11/00*

U.S. Cl. 83—862 **4 Claims**



1. A method of distortion-free tube cutting comprising the steps of:

(a) notching a section of tube wall;

(b) cutting through the tube using a first blade having a width less than the diameter of the tube along a first path which enters the previously cut notch;

(c) notching a second uncut section of tube wall adjacent the first path; and

(d) thereafter cutting through the remaining uncut walls of the tube using a second blade along a second path which enters the subsequently cut notch and which path is angularly spaced from the first path.

4,457,201

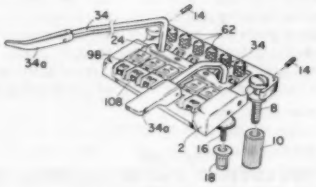
COMBINED BRIDGE AND TAILPIECE ASSEMBLY FOR A STRINGED MUSICAL INSTRUMENT

David C. Storey, 737 Pine St. #33, San Francisco, Calif. 94108

Continuation-in-part of Ser. No. 260,977, May 6, 1981, abandoned. This application Aug. 31, 1982, Ser. No. 413,490

Int. Cl.³ G10D *3/04*

U.S. Cl. 84—313 **15 Claims**



1. A combined bridge and tailpiece assembly for a stringed musical instrument, comprising

(a) a tailpiece block containing a recess;

(b) an elongate tailpiece member having a generally L-shaped vertical cross-sectional configuration including generally horizontal and vertical leg portions, said tailpiece member being arranged in said recess and connected with said block for rotation about a longitudinal axis adjacent the free edge of said vertical leg portion, thereby

to provide camming action to said rotating tailpiece member;

(c) longitudinally spaced attachment means connected with said tailpiece member and adapted for receiving and securing the ends of the instrument strings, respectively, whereby tensioning of the instrument strings normally biases said tailpiece member in one direction of rotation;

(d) adjustable bridge means connected with said tailpiece block and including roller means for guiding the instrument strings to said attachment means;

(e) spring means biasing said tailpiece member in the other direction of rotation, thereby to resist the rotating force exerted on the tailpiece member by the tensioned strings; and

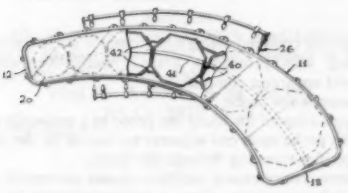
(f) lever means connected with said tailpiece member for manually rotating the same relative to said tailpiece block during sounding of the instrument, thereby to produce a vibrato effect.

4,457,202

DRUM SET APPARATUS

Steven J. DeBarbrie, 1555 Mesa Verde Dr., E #18A, Costa Mesa, Calif. 92626

Filed Sep. 16, 1982, Ser. No. 418,665
Int. Cl.³ G10D *13/02*
U.S. Cl. 84—411 R **1 Claim**



1. A drum set comprising:

an elongated, arcuate hollow, open-bottom shell having a greater depth at one end than at its opposite end;

a plurality of sound chambers surrounded by said shell whereby access to each of said chambers is available via the top of said shell;

a sound generator associated with each of said sound chambers and lying on the same horizontal plane with the shell top;

means supporting said shell on a supporting surface to maintain said sound generator on the horizontal plane of said shell top;

said supporting means is a second arcuate shell under said first shell;

said second arcuate shell having at least one sound chamber covered by a sound generator exposed at the back side of said drum set;

said sound chambers are open-ended and said sound generator is a sheet held taut across the top of said first shell in close proximity to the open-end of each of said sound chambers;

stanchions supporting first shell on said second shell in fixed spaced apart relationship; and

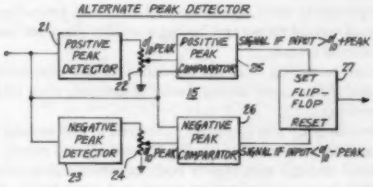
said sound chambers are each of octagon shape in cross-section and attached to said shell in a row in side-by-side relationship.

4,457,203

SOUND SIGNAL AUTOMATIC DETECTION AND DISPLAY METHOD AND SYSTEM

Steve A. Schoenberg, Clifton Park; David G. Ellis, Ballston Lake, and Jesse Aronstein, Poughkeepsie, all of N.Y., assignors to Wright-Malta Corporation, N.Y.

PCT No. PCT/US80/00873, § 371 Date Mar. 9, 1982, § 102(e) Date Mar. 9, 1982, PCT Pub. No. WO82/00379, PCT Pub. Date Feb. 4, 1982
PCT Filed Jul. 15, 1980, Ser. No. 356,501
Int. Cl.³ G10G *7/02*; G09B *15/02*
U.S. Cl. 84—454 **38 Claims**



1. A sound pitch automatic detection circuit comprising:

(a) sound signal transducer means responsive to a sound signal in the form of a note being played or voiced for converting the sound signal to an electrical signal having corresponding audio frequency characteristics and a generally sinusoidally varying waveshape;

(b) amplifier means having audio frequency bandpass characteristics compatible with the sound signal frequency spectrum over which the sound signal extends and for amplifying the electrical signals derived by said transducer means;

(c) alternate positive polarity and negative polarity peak voltage detector means continuously responsive to the output from said amplifier means for detecting the first major positive going peak voltage and the first major negative going peak voltage which exceed respective positive and negative threshold voltage values and occurring in each fundamental period of the generally sinusoidally varying waveshape electric signal; and

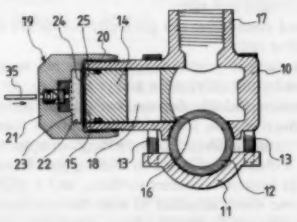
(d) output circuit means responsive to the output from said alternate positive polarity and negative polarity peak voltage detector means for deriving an output electric signal representative of the fundamental frequency of the sound signal.

4,457,204

EXPLOSIVE CHARGE-CONTAINING NUT

Erne Blomgren, Kungälv, Sweden, assignor to Kitz Corporation, Tokyo, Japan

Filed Jul. 21, 1981, Ser. No. 285,608
Int. Cl.³ F41F *13/00*; F16L *41/04*
U.S. Cl. 89—1 B **2 Claims**



1. An explosive charge holding nut for use with a T-joint of

the type comprising a two-part housing for clamping to a pipe and enclosing a member for cutting a hole in said pipe upon ignition of the charge to form a branch conduit from said pipe, wherein said nut comprises a cylindrical wall portion having means for attachment to said housing and a base portion,

a first circular recess in the inner face of said base portion facing said housing having a volume sufficient to receive an explosive charge to produce the desired cutting action and a diameter no larger than the inner diameter of the housing at the part thereof attached to said nut,

a cylindrical second recess, coaxial with and extending from said first recess and having a smaller diameter than said first recess,

a cylindrical third recess, coaxial with and extending from said second recess and having a smaller diameter than said second recess,

a bore extending from the outer face of said base portion to said third recess having a smaller diameter than said third recess,

a breech body axially slidably received in said second recess and adapted to substantially fill said second recess,

a bore through said breech body communicating with said first recess and said third recess and substantially coaxial therewith,

a percussion cap within said bore in the breech body, and

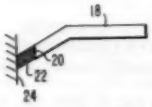
an anvil slidably disposed in said third recess and extending from said bore in said base portion to said percussion cap, so that said charge can be exploded only by inserting a pin type member through said bore in said base portion to propel said anvil against said percussion cap to fire said percussion cap which ignites the charge.

4,457,205

MULTIPLE FIBER ARMATURES FOR ELECTROMAGNETIC LAUNCHERS

David P. Ross, Center Township, Beaver County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 9, 1981, Ser. No. 328,887
Int. Cl.³ F41F *1/02*
U.S. Cl. 89—8 **14 Claims**



14. An electromagnetic projectile launcher comprising:

a first conductive rail;

a second conductive rail generally parallel to said first conductive rail;

a high current power supply connected to said first and second conductive rails; and

an armature slidably disposed between said first and second conductive rails, for conducting current therebetween;

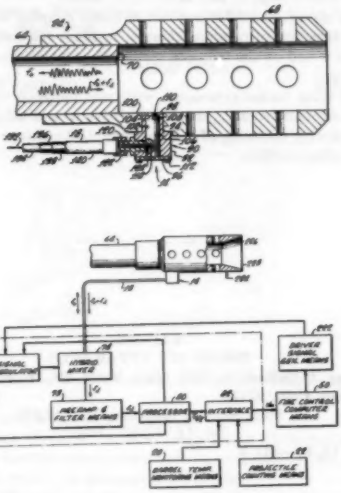
said armature including an insulating armature support member, a chevron attached to said support member and having at least two contact surfaces, and a plurality of conductive fibers attached to said chevron contact surfaces wherein said conductive fibers conduct current densitites on the order of a giga-amp per square meter while being driven along the rails.

4,457,206

MICROWAVE-TYPE PROJECTILE COMMUNICATION APPARATUS FOR GUNS

Peter P. Toulios, Oakbrook, and Kenneth D. Hartman, DeKalb, both of Ill., assignors to Ares, Inc., Port Clinton, Ohio

Division of Ser. No. 62,558, Jul. 31, 1979, Pat. No. 4,283,989.
This application Jun. 2, 1981, Ser. No. 269,489
Int. Cl.³ F41F *17/00*
U.S. Cl. 89—14 R **11 Claims**



1. Projectile communicating apparatus, for microwave communicating with projectiles having microwave receiving means, said apparatus comprising:

(a) a microwave probe;

(b) means adapted for fixing the probe to a projectile barrel with a probe inner end adjacent to, but out of, the path of projectiles traveling through the barrel;

(c) microwave reference oscillator means connected to the probe for providing microwave energy thereto for introduction thereby into the barrel to which the probe is fixed, frequency of said oscillator means being selected, relative to barrel diameter, to excite a single fundamental electromagnetic mode in the barrel; and,

(d) means enabling selective modulation of the reference oscillator frequency in a manner encoding therein information to be communicated, through the probe and barrel, to a moving projectile in the barrel.

4,457,207

BARREL CHAMBER

Kjell Eriksson, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

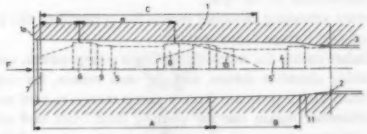
Filed Mar. 18, 1982, Ser. No. 359,622
Claims priority, application Sweden, Mar. 25, 1981, 8101896
Int. Cl.³ F41F *17/02*
U.S. Cl. 89—14 R **4 Claims**

1. An improved gun barrel for use with ammunition units of the type having a body with a first longitudinal axis, a rearward driving band of diameter d_2 extending radially outwardly from the body and a forward guiding ring of diameter d_1 less than d_2 spaced axially forward a distance a from said driving band, said barrel comprising:

an elongated body:

a bore within said body, said bore having a second longitudinal axis, said bore comprising a forward, rifled portion

with a diameter D_1 and a rearward breech chamber, said breech chamber comprising a rear cavity and a forward cavity opening from said rear cavity toward said rifled portion, said forward cavity having an axial length B at least substantially equal to the distance a between the rearward driving band and the forward guiding ring of the ammunition unit and a diameter D_2 greater than said diameter D_1 of said rifled portion and greater than the diameters d_1 and d_2 of the forward guiding ring and the



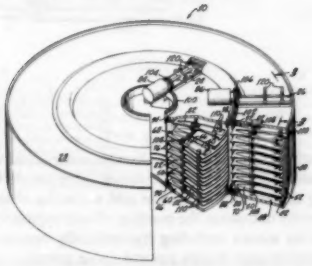
rearward driving band of the ammunition unit, said length B and said diameter D_2 of said forward cavity thereby forming means for guiding the ammunition unit during ramming thereof into said breech chamber by causing said driving band to enter said forward cavity and engage said diameter D_2 to move the first longitudinal axis of the ammunition unit into substantial coincidence with said second longitudinal axis of said bore, before said forward guiding ring enters said rifled portion.

4,457,208

DRUM-TYPE AMMUNITION MAGAZINE

Michael D. Golden, Costa Mesa, Calif., assignor to Western Design Corporation, Irvine, Calif.

Filed Jun. 7, 1982, Ser. No. 385,506
Int. Cl.³ F41D *10/26*
U.S. Cl. 89—33.02 **13 Claims**



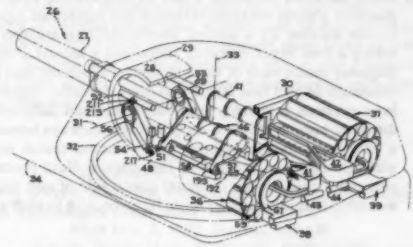
1. An ammunition magazine comprising:
a drum-type housing;
means defining a plurality of bays concentrically disposed within the drum-type housing;
means including a plurality of fixed tiered partitions disposed in each of the concentrically disposed bays for supporting ammunition rounds therein;
ammunition carrier means rotatably mounted within each concentrically disposed bay for moving said ammunition rounds within said concentrically disposed bays and between said tiered partitions; and,
means for rotating said ammunition carrier means within the concentrically disposed bays.

4,457,209

AUTOMATED LARGE CALIBER AMMUNITION HANDLING SYSTEM

John L. Scheurich, Excelsior, and Gary J. Nelson, Buffalo, both of Minn., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 181,575, Aug. 27, 1980, abandoned. This application Nov. 19, 1982, Ser. No. 443,341
Int. Cl.³ F41F *9/06*
U.S. Cl. 89—45 **12 Claims**



1. A system providing rapid transfer of ammunition rounds to a breech of a cannon which is independently movable in both azimuth and elevation positions, comprising:
means mounted in fixed azimuthal relation with the cannon for azimuthal movement therewith for storing an array of ammunition round components, said means for storing being indexable about a substantially horizontally disposed indexing axis and including a projectile store having a plurality of chambers therein accepting the projectiles, a propellant charge store having a plurality of chambers therein accepting the charges, and being non-movable with said cannon in elevation;
a projectile and a propellant charge support tray adapted to receive the ammunition rounds from said array and movable between receiving positions adjacent said means for storing and loading positions adjacent the breech;
a projectile and a propellant charge cradle arm each independently rotatable about an elevation axis for the cannon;
means for pivotally attaching said projectile and propellant charge support trays to respective projectile and propellant charge cradle arms and for providing rotational movement of said tray between said receiving and loading positions;
means for indexing each of said stores to bring predetermined ones of said plurality of chambers adjacent to said receiving position;
means for transferring ammunition rounds from said means for storing to said support trays in said receiving positions;
means for loading ammunition rounds into the breech from said support trays when in said loading positions;
and computer means coupled to and both sequentially and simultaneously interrogating the positions of and providing actuating commands for said means for storing, means for transferring, cradle arms, support trays and means for loading to thereby deliver a series of ammunition rounds from said array to the breech.

4,457,210

ROTARY ACTUATOR WITH ENERGY CONSERVATION

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Filed Sep. 24, 1982, Ser. No. 423,140
Int. Cl.³ F15B *11/15, 15/17*
U.S. Cl. 91—355 **7 Claims**

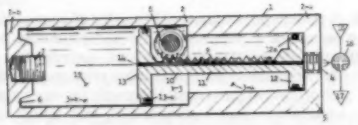
1. An energy conserving air motor comprising:
an elongated housing with a differential diameter bore passing therethrough between a first larger diameter bore portion entering a first end of said housing partway toward a second end thereof in communication substan-

tially midway therebetween through a diametral step with a second smaller diameter bore portion entering a second end of said housing partway toward a first end thereof terminating with said diametral step,

said bore including a first end closure means in said first larger diameter end of said housing, and a second end closure means in said second smaller diameter end of said housing,

a fluid port in said second end closure means for supply and exhaust of a working fluid entering and leaving said port,

a piston assembly including a pair of cooperating different diameter pistons coaxially arranged and connected rigidly to one another by a central interconnecting member of which a first larger diameter piston and a second smaller diameter piston each of slightly smaller diameter than the diameters of said first larger and second smaller diameter bore portions is slidably received inside said differential diameter bore to move linearly therein sideways between a first normally atmospheric and a second piston energized positions in response to the working lfuid pressure energizing said smaller diameter piston side of said piston assembly first with an end force large enough to shift said



piston assembly into said second energized position at which time said working fluid enters a backside of said first larger diameter piston via an internal pilot porting means incorporated into said central interconnecting member for fluid communication between said smaller and larger piston sides exerting an opposite considerably larger end force over said first larger diameter piston side than that exerted over said second smaller diameter piston side forcing an automatic return of said piston assembly from said second energized to said first atmospheric position by the use of the same air twice first before said working fluid is allowed to exhaust facilitating great energy conservation by the fact that said piston assembly is moved first from said atmospheric position, thereby inducing a first single stroke to said piston assembly by a slug of air introduced thereto via said fluid port to energize said second smaller diameter piston resulting in said second energized position and subsequently, at the end of said single stroke, energizing said first larger diameter piston to in fact perform a second stroke by the same air while returning said piston assembly back into said first original position, completing the cycle at practically no cost, and vice-versa.

4,457,211

HYDRAULIC VALVE AND CONTROL SYSTEM

Daniel W. Risk, 1733 Canyon Dr., Fullerton, Calif. 92633

Continuation-in-part of Ser. No. 005,106, Jan. 22, 1979, abandoned, which is a division of Ser. No. 733,679, Oct. 18, 1976, Pat. No. 4,153,074, which is a continuation-in-part of Ser. No. 332,986, Feb. 15, 1973, abandoned. This application Feb. 19, 1982, Ser. No. 350,705

Int. Cl.³ F15B *11/08, 13/042*

U.S. Cl. 91—446 **9 Claims**

1. Hydraulic control valve structure for controlling a load in upward and downward directions comprising:

a valve housing having an intermediate chamber adapted for connecting said valve structure to a hydraulic pump means;

a tank chamber adapted for connecting said valve structure to a tank means;

a jack chamber adapted for connecting said valve structure to a jack means;

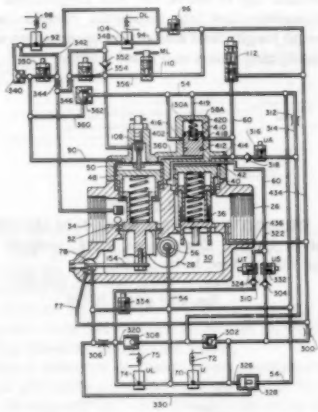
interconnecting means for interconnecting a pump means to said intermediate chamber to enable fluid flow from a pump means to said intermediate chamber;

bypass valve means for interconnecting said intermediate chamber to said tank chamber for controlling upward movement of the load;

down valve means for interconnecting said jack chamber to said intermediate chamber for controlling downward movement of the load;

bypass actuating chamber means for controlling the position of said bypass valve means;

conduit means for interconnecting a pump means, said actuating chamber means, and the tank means, for supplying fluid under pressure from a pump means to said actuating chamber means and for venting fluid from said actuating chamber means to the tank means, said conduit means establishing two different fluid flows in time sequence



relative to said actuating chamber means, and said conduit means including bypass control valve means for controlling the amount of fluid in said actuating chamber means thereby to control the position of said bypass valve means;

actuating means including hydraulically opposed areas for actuating said bypass control valve means;

means for applying pressure from a pump means to one of said opposed areas of said actuating means;

means for applying pressure from said jack chamber to the other opposed area of said actuating means;

said actuating means being responsive to the pressure from a pump means and the pressure in said jack chamber;

buildup of pressure from a pump means effecting movement of said bypass valve means from open to partially closed position by supplying fluid to said actuating chamber means, and also effecting actuation of said bypass control valve means by application of pressure to said one of said opposed areas;

thereby effecting rapid sizing of said bypass valve means in the up mode of operation.

4,457,212
HYDRAULIC RAM

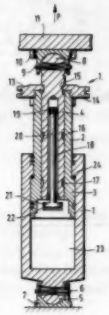
Eberhart Unger, Lünen; Herbert Heitkamp, Werne; Heinz Hessel, Flaesheim; Karl-Heinz Plester, and Manfred Lagodka, both of Lünen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lünen, Fed. Rep. of Germany

Filed Apr. 5, 1982, Ser. No. 365,467

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114525

Int. Cl.³ F15B *15/26*

U.S. Cl. 92—18 **18 Claims**



1. A hydraulic ram comprising a cylindrical outer member, a cylindrical inner member disposed within the outer member and reciprocable relative thereto, an extension member disposed within the inner member and reciprocable relative thereto, a clamping device for releasably locking the extension member to the inner member, and drive means provided at least partly within the extension member for retracting the extension member rapidly within the inner member.

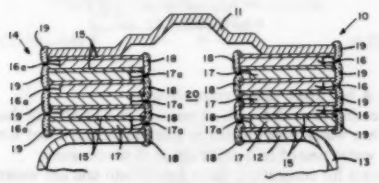
4,457,213
BELLOWS STRUCTURE AND METHOD

David L. Morgan, Stratford, Conn., assignor to Seymour-Sheridan, Inc., Stratford, Conn.

Filed Sep. 29, 1982, Ser. No. 427,603

Int. Cl.³ F01B *19/02;* **F16J** *3/04*

U.S. Cl. 92—42 **5 Claims**



1. A flexible diaphragm bellows element for a bellows assembly comprising a plurality of thin, metallic, flexible annuli comprising the free plates of said bellows and forming a fluid-tight compartment in said assembly, said free plates having inner and outer peripheries which are substantially identical to each other, at least one interior or exterior spacer annulus comprising a support plate having coplanar surfaces and having an outer or inner periphery which is substantially identical to the outer or inner periphery of said free plates and having an inner or outer periphery which is substantially larger or smaller than the inner or outer periphery of said free plates, each said spacer annulus, if it is an interior support plate, being welded to and between the exterior peripheries of a pair of said free plates which are welded together at said exterior peripheries by means of a weld bead having a thickness greater than the combined thickness of the exterior peripheries of said welded free plates and spacer annulus, and each said spacer annulus, if it is an exterior support plate, being welded to and between an alternate pair of said free plates which are welded together at said interior peripheries by means of a weld bead having a thickness greater than the combined thickness of the interior peripheries of said welded free plates and spacer annulus, to provide a bellows having at least one interior or exterior support plate having one periphery welded between the exterior or interior peripheries, respectively, of a pair of said free plates and having its other periphery free of attachment and extending to a position proximate but short of the weld beads of the interior or exterior peripheries, respectively, of said free plates to adjacent free plates, each said support plate being of sufficient thickness that its free periphery spaces and proximate weld beads against strong compressive forces with each other when the bellows is retracted.

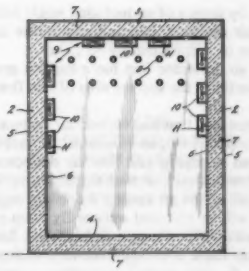
4,457,214
REFRIGERATED STRUCTURE

Egbert deVries, Kettering, Ohio, assignor to Quad Environmental Technologies Corporation, Highland Park, Ill.

Filed Dec. 7, 1982, Ser. No. 447,638

Int. Cl.³ B64D *13/00;* **F24F** *7/00;* **F25D** *25/00*

U.S. Cl. 98—1.5 **2 Claims**



1. A refrigerated chamber comprising:

sidewall, ceiling and floor structures, said structures having inner and outer surfaces with insulating material therebetween;

a plurality of air pressurizing means mounted on the interior surface of said ceiling structure and the upper portions of said sidewall structures, at least one of said ceiling and sidewall structures having sufficient porosity at the location of said air pressurizing means to allow air from said pressurizing means to penetrate and pressurize said insulation, each of said air pressurizing means capable of delivering air flow and being mounted so as to force refrigerated air towards said ceiling and said upper portions of said sidewalls, whereby on operating said air pressurizing means, the air pressure within said insulation of said sidewalls and said ceilings is rendered greater than the ambient air pressure.

4,457,215
DUCT AIR COVER

Edward H. Vogt, 118 E. 46th St., Tacoma, Wash. 98404

Continuation of Ser. No. 129,999, Mar. 18, 1980, abandoned. This application Jun. 2, 1982, Ser. No. 384,435

Int. Cl.³ F24F *13/10*

U.S. Cl. 98—103 **3 Claims**

1. An air duct air-deflector assembly, comprising:

a frame capable of being secured to an air register;

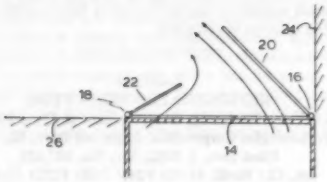
a first air deflector flap;

first hinge means connecting said first air deflector flap to

one side of said frame such that said first air deflector flap is movable in a counterclockwise direction relative to said frame from its closed position to its open position under the influence of air issuing from said register, wherein said open position of said first air deflector flap is defined by means of an included angle defined between said first air deflector flap and said frame having a maximum value of approximately 30°;

a second air deflector flap;

second hinge means connecting said second air deflector flap to the opposite side of said frame such that said second air deflector flap is movable in a clockwise direction relative to said frame from its closed position to its open position under the influence of air issuing from said register, wherein said open position of said second air deflector flap



is defined by means of an included angle defined between said first air deflector flap and said frame having a maximum value of approximately 45°; and

said second air deflector flap has a surface area of approximately two times the surface area of said first air deflector flap,

whereby when said first and second air deflector flaps move to their respective open positions, air issuing from said register and engaging said first air deflector flap will be directed toward said second air deflector flap, and substantially all of the air issuing from said register and said assembly will be directed outwardly from said assembly, and between the nonhinged ends of said first and second air deflector flaps, at an angle inclined with respect to said frame.

4,457,216

METHOD FOR PRODUCING COFFEE AND COFFEE MACHINE FOR CARRYING OUT THE METHOD

Engelbert Dremmel, Nottwil, Switzerland, assignor to Kurt Rost, Friesliraln, Switzerland

PCT No. PCT/CH81/00107, § 371 Date May 20, 1982, § 102(e) Date May 20, 1982, PCT Pub. No. WO82/01120, PCT Pub. Date Apr. 15, 1982

PCT Filed Sep. 29, 1981, Ser. No. 385,411

Claims priority, application Switzerland, Mar. 10, 1980, 7378/80

Int. Cl.³ A47J *31/00*

U.S. Cl. 99—287 **12 Claims**

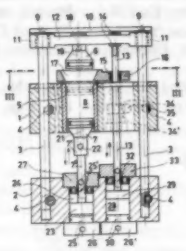
1. A coffee machine comprising:

upper and lower pressure pistons arranged to move independently in opposite directions within a cylinder, said cylinder being open at both ends so that said upper piston and said lower piston are freely removable out of engagement with said cylinder;

two carrier plates mounted on vertical rods one above the other in spaced relation;

a scalding chamber for receiving loose coffee powder, said scalding chamber comprising said cylinder and said lower piston within said cylinder, and said cylinder being embedded in one of said carrier plates;

hydraulic means carried by the other of said carrier plates for actuating said pressure pistons independently of each other between a ready position and a working position, said upper piston in its ready position being slidable into said cylinder to close said scalding chamber and said lower piston in its ready position being slidably further into said cylinder to compress said coffee powder; and,



a hot water conduit leading to said closed scalding chamber and a coffee outflow conduit leading from said closed scalding chamber.

4,457,217

HOT DRINK MAKERS

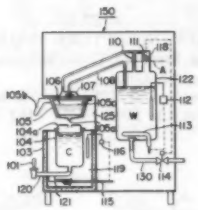
Akira Ogawa, Mishima, and Yasuyuki Iida, Shizuoka, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1983, Ser. No. 475,211

Claims priority, application Japan, Mar. 19, 1982, 57-44278

Int. Cl.³ A47J *31/00*

U.S. Cl. 99—295 **7 Claims**



1. A hot drink maker comprising:

a casing provided with an opening at a front wall thereof;

a hot water tank located in said casing and filled with hot water heated to a predetermined temperature;

means for controlling water supply into said hot water tank;

a funnel filled with material for preparing hot drink and detachably fitted to said casing in said opening;

a spray head located above said funnel;

a hot water supply pipe interconnecting said hot water tank and said spray head for supplying the hot water from said hot water tank to said funnel;

a storage tank for storing prepared hot drink disposed in said casing just below said funnel;

a heat insulating box arranged so as to surround said storage tank with space therebetween;

a heater disposed in said space for heating uniformly said storage tank to a predetermined temperature; and

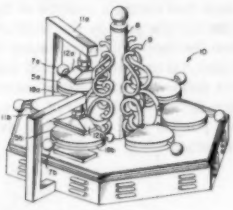
a cock for taking out the prepared hot drink in said storage tank through an outlet pipe extending from the bottom of said storage tank.

4,457,218

BAKING MACHINE FOR ICE CREAM CONES AND THE LIKE

Steven R. Gruber, Vienna; Dwight C. Green, Ashburn, both of Va., and Mark A. Bautista, Germantown, Md., assignors to Classic Cone Works Ltd., Washington, D.C.

Filed Sep. 30, 1982, Ser. No. 430,482
Int. Cl.³ A47J 37/00, 37/01
U.S. Cl. 99—373 11 Claims



1. A baking machine for cooking batter to form ice cream cones and the like, comprising:

a plurality of griddles disposed in a generally circular arrangement in a plane for holding the batter;

support means connected to said plurality of griddles for supporting same;

heating means disposed above and below said plane for providing heat to objects passing through at least one heating zone therebetween; and

motor means connected to said support means for actuating said support means to move said plurality of griddles along a path defined by said circular arrangement so that said plurality of griddles pass consecutively through said at least one heating zone, whereby said batter is cooked;

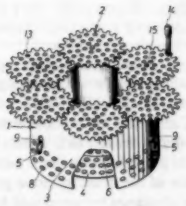
wherein said machine includes operator actuable clutch means for selectively engaging or disengaging the motor means so as to selectively drive or not drive said support means, whereby respectively to move or not move said plurality of griddles.

4,457,219

ANNULAR ROTATING ROASTER

Ming-Tang Chen, No. 14 Alley 89 La. 59 Nan Men Rd., Taichung, Taiwan

Filed Sep. 22, 1982, Ser. No. 421,076
Int. Cl.³ A47J 37/04
U.S. Cl. 99—449 10 Claims



1. An annular roaster comprising:

a vertical open outer cylinder having a plurality of spaced apertures lying in a horizontal plane through a lower portion of said outer cylinder, a plurality of ventilating holes below said apertures, and a plurality of spaced fastening rods vertically mounted on an upper portion of said outer cylinder and projecting above the plane of its top;

a smaller diameter equal length vertical open inner cylinder removably concentrically mounted within said outer cylinder having a plurality of corresponding apertures to those in said outer cylinder and lying in the same plane, and a plurality of ventilating holes below said apertures;

connecting means for removably connecting said outer cylinder and said inner cylinder comprising a plurality of connecting rods, each adapted to pass through an aperture in said outer cylinder and a corresponding aperture in said inner cylinder;

grate means comprising a perforated disc whose outer diameter is smaller than the inner diameter of said outer cylinder and having a circular cut-out center whose diameter is larger than that of said inner cylinder, said disc resting upon the plurality of said connecting rods, for spacing said cylinders from one another and affording a platform for burning fuel;

a plurality of circular perforated and toothed plates each having a central hole, corresponding in number to the number of said fastening rods and each one of said plates being concentrically removably mounted on each said fastening rod, said plates being of sufficient size so that the plurality of said plates forms an interlocking circular gear assembly; and

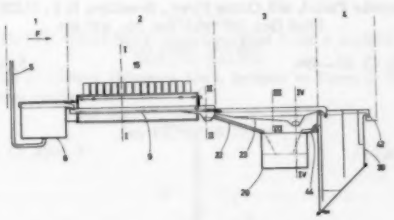
turning handle means fastened to one of said plates, so that turning said one plate engages all of the remaining plates in said gear assembly.

4,457,220

APPARATUS FOR CONTINUOUSLY SEPARATING FAT FROM BUTTER

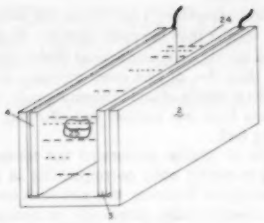
Jacques Entremont, Veyrier du Lac, and Raymond Levardon, Paris, both of France, assignors to Entremont S.A., Annecy, France

Division of Ser. No. 253,348, Apr. 13, 1981, Pat. No. 4,405,651.
This application Apr. 20, 1982, Ser. No. 370,026
Claims priority, application France, Apr. 29, 1980, 80 10117; Jan. 21, 1981, 81 01073
Int. Cl.³ A23C 15/14
U.S. Cl. 99—451 12 Claims



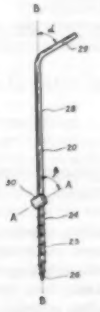
1. Apparatus for the continuous separation of fat from a food material comprising a molten food feed apparatus, a microwave treatment apparatus for receiving molten food from said feed apparatus, and settling apparatus for receiving treated food from said microwave treatment apparatus, said microwave treatment apparatus including a channel through which flows molten food from said feed apparatus, a chamber made of an electrically conducting material, and a microwave generator, said channel being substantially horizontally disposed within said chamber and having a width a plurality of times the depth of the molten food flowing through said channel, said microwave generator being disposed in said chamber so as to provide an ultra-high frequency electromagnetic field in the internal region of the chamber which contains said channel.

4,457,221
STERILIZATION APPARATUS
David K. Geren, 4601 Gloria Ave., Encino, Calif. 91436
Continuation-in-part of Ser. No. 219,459, Dec. 23, 1980, abandoned. This application Aug. 8, 1983, Ser. No. 525,991
Int. Cl.³ A23L *3/00, 3/26, 3/32*
U.S. Cl. 99—451 **12 Claims**



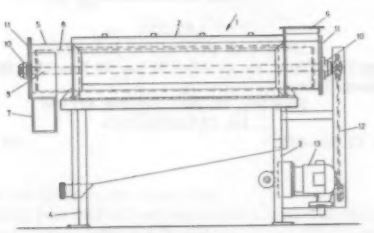
1. Apparatus for killing organisms resident within a host, comprising:
(a) an electrically non-conductive container (**2** or **27**) for receiving the host,
(b) an electrically conductive liquid (**24**) within said container and surrounding the host,
(c) electrodes (**3,4** or **28,29,30**) symmetrically disposed within said container, characterized by each electrode face having equal surface area and being parallel to and equidistant at all points from its next adjacent electrode, and contacting said liquid, and
(d) a pulsed electric source (**1,3,5,6,13**, etc.) connected to said electrodes to pass electric current through the liquid, the host, and concomitantly through the organisms, in the form of short pulses having a duration within the range of 200 microseconds to five milliseconds each, of successive alternate polarity and a rise time of a small fraction of the 200 microsecond interval, and not of less than 50 milliamperes average current per square centimeter of host, ranging up to five amperes per square centimeter, and occurring between 100 and 1,000 times per second.

4,457,222
KITCHEN UTENSIL
Menashe Finkel, 665 Ocean Pkwy., Brooklyn, N.Y. 11230
Filed Oct. 21, 1982, Ser. No. 435,644
Int. Cl.³ B26B *3/04*
U.S. Cl. 99—494 **5 Claims**



1. A kitchen utensil for producing a hollow region in certain food articles and spirally shaped members from a material removed from said region comprising:
an elongated rod member having a threaded end portion, a substantially straight elongated middle portion connected to the threaded end portion and a plain end portion disposed at an angle to the middle portion;
a cutting member having a front cutting edge, a back edge and an aperture going there through from the front cutting edge to the back edge, the cutting member being fixedly attached to the threaded end portion of the elongated rod member in such manner that an axis of the aperture is substantially parallel to the directions of threads of the threaded end portion;
the height of said elongated middle portion is of sufficient length such that during a rotation of the utensil about an axis of the middle portion the front cutting edge penetrates into the food article producing the hollow region and the material removed from said region as said region is formed defines spirally shaped members which move longitudinally having the axis of the middle portion and plain end portion as a longitudinal axis of said spirally shaped members.

4,457,223
GRAPE CRUSHER
Cesare Spinato, 59 Fosters Rd., Greenacres, South Australia, Australia 5086
PCT No. PCT/AU81/00048, § 371 Date Dec. 30, 1981, § 102(e) Date Dec. 30, 1981, PCT Pub. No. WO81/03111, PCT Pub. Date Nov. 12, 1981
PCT Filed Apr. 30, 1981, Ser. No. 336,343
Claims priority, application Australia, May 1, 1980, PE3371
Int. Cl.³ A23N *1/00, 15/02*
U.S. Cl. 99—510 **7 Claims**

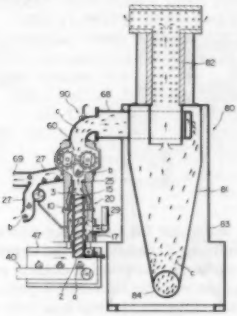


1. A grape handling and de-stemmer apparatus comprising a perforated generally horizontal stationary drum, an inlet at one end of the drum, an outlet at the opposite end, a driven shaft eccentrically mounted within said drum, blades mounted on said driven shaft to provide a clearance between the blades and the internal surface of the drum to move grapes from said inlet to said outlet, the clearance between said blades and said drum being greater at the top than the bottom, and means to rotate said shaft at a speed to move the grapes in range of about 5 meters per second to about 20 meters per second circumferential speed over the internal surface of the drum while removing the grapes from the stalks and opening the grapes for the juice to be extracted by rolling said grapes between the blades and the internal surface of the drum in the decreasing clearance at the bottom of the drum to split said grapes, the grapes falling from the blades in the increased clearance toward the top of the drum.

4,457,224
APPARATUS FOR STRIPPING ONIONS

Mitsutaro Kino, Yokohama, Japan, assignor to Fuji Foods Engineering Co., Ltd., Yokohama, Japan

Filed Apr. 6, 1982, Ser. No. 365,947
Claims priority, application Japan, Nov. 21, 1981, 56-187361; Nov. 21, 1981, 56-187362; Nov. 21, 1981, 56-187363; Nov. 21, 1981, 56-187364; Nov. 21, 1981, 56-187365; Nov. 21, 1981, 56-187366; Nov. 21, 1981, 56-187367; Nov. 21, 1981, 56-187368; Nov. 21, 1981, 56-187369
Int. Cl.³ A23N 7/00
U.S. Cl. 99—516 18 Claims

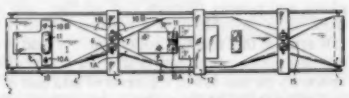


1. An apparatus for stripping onions, comprising means defining a generally cylindrical onion guide path having a diameter only slightly greater than that of the onions to be stripped; means defining a generally cylindrical separating chamber adjacent a first end of and substantially coaxial with said onion guide path, said separating chamber having a diameter at least as large as that of said onion guide path; means for supplying an onion to be stripped to an inlet location in the region of a second end of said onion guide path which is remote from said first end thereof; and compressed air discharge means in the region of said first end of said onion guide path for producing a jet of air which flows from the periphery of said onion guide path in a direction toward said separating chamber and for producing a vacuum in said onion guide path which causes an onion at said inlet location to be drawn into and propelled through said onion guide path and said separating chamber, said jet of air striking the onion as it passes through said separating chamber and causing an outer skin of the onion to be stripped off.

4,457,225
APPARATUS FOR THE PREPARATION OF A FOODSTUFF CONSISTING OF A STUFFING ROLLED IN A WRAP

Arie Bakker, Gouda, Netherlands, assignor to Bamach, B. V., Lekkerkerk, Netherlands

Division of Ser. No. 40,766, May 21, 1979, abandoned. This application Mar. 9, 1981, Ser. No. 241,927
Int. Cl.³ A21C 9/00, 9/06
U.S. Cl. 99—450.6 5 Claims

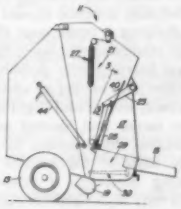


1. Apparatus for preparing a wrapped food product of a stuffing and an edible wrap wherein the stuffing is of a predetermined length and thickness and the wrap comprises a first substantially rectangular portion, the long dimension of which exceeds the length of the stuffing and the short dimension of which is substantially equal to the thickness of the stuffing and a second portion extending from one of the long sides of the first substantially rectangular portion midway between its ends of a width at its proximal end at least equal to the length of the stuffing and of a length greater than the thickness of the stuffing with the long dimension of the stuffing positioned on the first substantially rectangular portion of the wrap with its long dimension paralleling the longitudinal dimension of said first substantially rectangular portion of the wrap and centered therein, the apparatus comprising a transversely-flexible, normally flat conveyor belt of a width exceeding the long dimension of the first substantially rectangular portion of the wrap, means supporting the conveyor belt for movement of a length thereof along a horizontal path, means for moving the conveyor belt continuously along said path with the wrap and stuffing deposited thereon, gate means stationary with respect to the movement of the conveyor belt comprising means positioned at opposite edges of the conveyor belt at a spacing narrower than the width of the conveyor belt between which the conveyor belt is moved continuously, said latter means having transversely-spaced, opposed, concave surfaces situated at a spacing corresponding substantially to the length of the stuffing and a horizontal surface parallel to the conveyor belt and spaced therefrom by an amount corresponding substantially to the thickness of the stuffing such that marginal portions of the flexible conveyor belt are curled upwardly at the ends of the stuffing and inwardly toward each other above and parallel to the medial portion of the conveyor belt as the conveyor belt moves relative to the gate to thus fold the end portions of the first substantially rectangular portion of the wrap extending beyond the ends of the stuffing about the ends and onto the upper side of the stuffing to cause them to adhere thereto, said gate means releasing the marginal portions of the conveyor belt as the latter leaves the gate means so that it returns to its normally flat condition and a rolling device supported above the conveyor belt beyond the gate means at a fixed position relative to the longitudinal movement of the conveyor belt and at a height therefrom to have contact with the folded-over end portions of the wrap as said end portions of the partially wrapped stuffing are moved into engagement therewith by the movement of the conveyor belt relative to the gate to roll the stuffing and wrap relative to the conveyor belt to dispose the second portion of the wrap in a coil about the stuffing.

4,457,226
TWINE-WRAPPING MECHANISM FOR A LARGE ROUND BALER

Gerald F. Meiers, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 17, 1981, Ser. No. 303,274
Int. Cl.³ B65B 13/18
U.S. Cl. 100—5 28 Claims



1. In an automatic twine-wrapping mechanism for a cylindrical baler having a bale-forming chamber, said mechanism comprising:

a twine-dispensing mechanism for dispensing twine into the bale-forming chamber of said baler for wrapping around a

bale being formed therein, said dispensing mechanism including a twine arm movable back and forth in front of the bale-forming chamber between first and second positions, and

hydraulic drive means for cycling said twine arm back and forth in front of said bale-forming chamber, said drive means including a double acting cylinder, a hydraulic pump connected to said cylinder, and pump drive means for selectively driving said pump, and a control valve interconnected between said cylinder and said pump, said valve having a valve control arm movable between a first valve control arm position permitting said twine arm to be driven from the first to said second twine arm position and a second valve control arm position permitting said twine arm to be driven from said second to said first twine arm position the improvement comprising;

a control means (1) for initiating a twine wrapping cycle by automatically actuating said pump drive means and by positioning said valve control arm in said first valve control arm position responsive to the formation of bale of a predetermined diameter in said chamber, and (2) for deactivating said hydraulic drive means following completion of the wrapping of twine around said bale.

4,457,227

EXTRACTION DEVICE

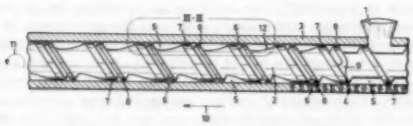
Klaus Koch, Laatzen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Nov. 10, 1981, Ser. No. 319,896

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045138

Int. Cl.³ B30B *9/12*

U.S. Cl. 100—117 **2 Claims**



1. An extraction device for removing liquid from a solid-liquid mixture comprising a having a dimiensionally fixed interior surface, hollow barrel, filter openings formed in said barrel below said inlet means, said barrel, having first and second end sections, said first end section including inlet means for supplying said mixture to the interior of said barrel, said second end section including outlet means for said solid components of said mixture, said first flight means having a peripheral edge spaced closely adjacent the fixed interior surface of said barrel thereby defining with said barrel a press thread in which the solid-liquid mixture is subjected to an intensive pressing action resulting in liquid being released from the mixture rotatably driveable screw means disposed within said hollow barrel, first flight means helically disposed on said hollow barrel, said first flight means defining a continuous thread for carrying said mixture and for extracting said liquid therefrom, said first flight means and said barrel jointly defining a flow path for said mixture, said flow path having an upstream and a downstream end region surface, and second flight means helically disposed on said screw means and located adjacent said first flight means, said second flight means having a peripheral ridge spaced closely adjacent the interior surface of said barrel thereby defining therewith a relatively small, fixed gap through which only liquid and very small particles of comminuted solid matter can pass, said second flight means defining with said first flight means a discharge thread for carrying said liquid removed from said mixture in a direction opposite to that of said flow path for said mixture, said thread defined by said second flight means having first and second closed ends, said first end being closed upstream, in the direction of flow of said mixture, of said outlet means for said solid components of said mixture and said second end being closed downstream, in said direction of flow of said mixture, of said inlet means, said discharge thread communicating with said fitter openings.

4,457,228

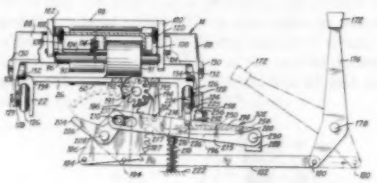
ROLLING PLATEN IMPRINTER

Harry Wittek, Hicksville, N.Y., assignor to Bartizan Corporation, Yonkers, N.Y.

Filed Mar. 24, 1982, Ser. No. 361,469

Int. Cl.³ B41F *3/04*

U.S. Cl. 101—45 **8 Claims**



1. An improved apparatus for imprinting characters embossed on cards comprising a substantially flat imprinting base having on its upper surface a first printing element comprising a card having characters embossed thereon; a platen carriage mounted for reciprocal movement on said base over said printing elements; a first roller platen and a second roller platen; a first roller platen axle rotatably mounting said first roller platen in said platen carriage; a second roller platen axle rotatably mounting said second roller platen in said platen carriage substantially parallel to said first axle and in side-by-side relationship; said first roller platen passing over and imprinting from said first printing element and said second roller platen passing over and imprinting from said second printing element; holding means for holding said first roller platen in a lowered position capable of imprinting characters during travel of said platen carriage over said card and for simultaneously holding said second roller platen in a raised, idle position; and shifting means automatically operated in one direction of travel of said platen carriage after said first roller platen passes over said first printing element for shifting and raised, second roller platen into a lowered position capable of imprinting characters and shifting said lowered platen roller simultaneously into a raised, idle position;

wherein said holding means includes two vertically oriented retaining springs, each of said springs being directly attached at their lower ends to each of said roller platen axles, a pair of substantially horizontal axle arms mounted on opposite sides of each of said roller platens, each of said axles being perpendicular to and being pressed upwardly by said springs against said axle arms, each of said axle arms being composed of a plurality of straight segments comprising a lower segment located adjacent to the center of said platen carriage and a higher segment located adjacent an edge of said platen carriage, said axle arms having coincident notches therein located adjacent to the center of said carriage platen; and

said shifting means includes a vertically oriented shift lever shaft which is pivotally mounted on said platen carriage and pivotable with respect to the travel of said carriage platen and passing through said notches, said shift lever shaft being movable from a position where it shifts said axle arms so that said first roller platen is held in a lowered printing position with said first roller platen axle pressing upwardly on said lower segments of said pair of axle arms and said second roller platen is in a raised, idle printing position with said second roller platen axle pressing upwardly on said higher segments of said pair of axle arms and to a position where said first roller platen is in a raised, idle position and said second roller platen is in a lowered printing position, and stop means on said base to act

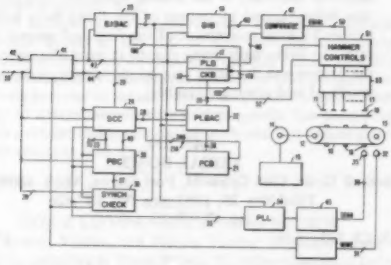
against said shift lever shaft during travel of said platen carriage and thereby shift said shift lever shaft.

4,457,229

SCAN CORRECTION FOR A LINE PRINTER HAVING MULTI-PITCH TYPE CARRIERS

James E. Carrington, Vestal, and Gerald R. Westcott, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,012
Int. Cl.³ B41J *1/20*; G06F *3/14*
U.S. Cl. 101—93.14 19 Claims



1. A control system for a line printer with an endless type carrier having uniformly spaced type characters continuously movable relative to a plurality of uniformly spaced print positions of a print line,

said type characters and said print positions having a relative spacing whereby said characters are alignable with said print positions in a plurality of subscan sequences,

a character storage device for storing character data in the order said type characters are arranged on said type carrier,

a data storage device for storing print data in the order characters are to be printed at said print positions of said print line,

means for supplying subscan pulses in response to the motion of said type characters relative to said print positions,

address means connected to said data and character storage devices,

said address means being operable for addressing said data and said character storage devices in subscan sequence dependent on said relative spacing of said type characters and said print positions,

scan control means responsive to said subscan pulses for activating said address means at the beginning of each subscan and to control said addressing of said data and character storage devices in subscan sequence, and address correction means including

correction memory means connected for addressing by said addressing means and containing correction control data and address correction data,

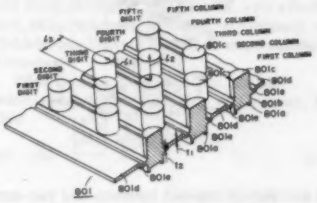
said correction memory means being further connected to said address means by correction control circuitry responsive to said correction control data to control the addressing of said correction memory means and to reset said address means at the end of each subscan in accordance with said address correction data in said correction memory means.

4,457,230

TYPEFONT WHEEL AND BELT FOR SMALL PRINTER

Hitoshi Kurihara, Chichibu, and Toru Wakazawa, Yokoze, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of, Japan

Filed Dec. 7, 1981, Ser. No. 328,186
Claims priority, application Japan, Dec. 12, 1980, 55-175980; Jan. 9, 1981, 56-1847; Jan. 12, 1981, 56-2871; Jan. 12, 1981, 56-2872; Jan. 12, 1981, 56-2873; Jan. 13, 1981, 56-3576; Jan. 13, 1981, 56-3577; Jan. 13, 1981, 56-3578
Int. Cl.³ B41J *1/32*
U.S. Cl. 101—110 11 Claims



1. A typefont wheel, comprising:

a cylindrical support member having plural through-holes on the periphery thereof and being provided with a hammer therein; and

a typefont belt being fitted around said support member and having one end portion with a plurality of holes and having another end portion with, on the top face of said belt, a plurality of projections which are fitted into said plurality of holes, said belt including:

groups of typefonts arranged on the top face in a predetermined order;

first pin portions protruding from the bottom face of said belt at positions corresponding to positions where said groups of typefonts are provided on the top face so that said first pin portions fit into through-holes; and

second pin portions protruding from the bottom face at positions corresponding to positions where said projections are provided on the top face so that said second pin portions fit with said through-holes, said second pin portions being formed lower than said first pin portions to prevent striking hereof by the hammer.

4,457,231

PHASE ADJUSTING APPARATUS OF SHEET-FED ROTARY PRINTING PRESS WITH TURN-OVER MECHANISM

Shoichi Kawaguchi, Ibaragi, Japan, assignor to Komori Printing Machinery Co., Ltd., Sumida, Japan

Filed Oct. 21, 1982, Ser. No. 435,820
Claims priority, application Japan, Oct. 24, 1981, 56-170278
Int. Cl.³ B41F *21/10*, *13/12*
U.S. Cl. 101—230 2 Claims

1. Phase adjusting apparatus for use in a sheet-fed rotary printing press having a turn-over mechanism in which a sheet to be printed is turned-over by a turn-over cylinder in contact with two adjacent printing cylinders, said apparatus comprising:

a fixed gear fixed to a shaft end of said turn-over cylinder for meshing with a gear on a printing cylinder on the downstream side;

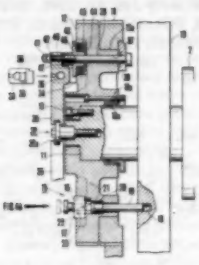
an adjusting gear loosely mounted on a shoulder of said fixed gear for meshing with a gear mounted on a printing cylinder on the upstream side;

an adjusting bolt adjustably threaded into an axial direction of said turn-over cylinder;

a plurality of radially extending two-armed levers with one end of each of said levers engaged with said adjusting bolt, said two-armed levers being pivoted to an outer surface of

said fixed gear to be swingable in a direction of movement of said adjusting bolt;

pins for urging and separating said adjusting gear to and from said fixed gear as said two-armed levers are swung, one end of each of said pins engaging a free end of each of said two-armed levers; and



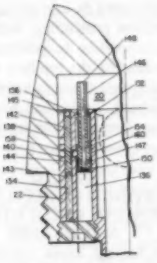
spring members interposed between said two-armed levers and said fixed gear concentrically with said pins, said spring members urging said adjusting gear against said fixed gear when said adjusting gear is urged against said fixed gear by said pins.

4,457,232

ARTILLERY FUZE FOR PRACTICE AND TACTICAL MUNITIONS

Lloyd D. Post, Randolph, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 3, 1983, Ser. No. 454,944
Int. Cl.³ F42C *15/26*
U.S. Cl. 102—233 **6 Claims**



1. An artillery impact fuze for practice or tactical munitions comprising:

a conically shaped body having a forward central longitudinal channel communicating with a rearward central chamber;

a firing pin assembly disposed in said channel, said firing pin assembly including a primary striker pin, a spring biased secondary striker pin in spaced apart relation rearward of said primary striker pin, and detent means for holding said secondary striker pin to project into a hole in each lever of the arming assembly, said detent means being responsive to centrifugal force to free said secondary striker pin to withdraw from said arming lever holes;

an arming assembly disposed in said chamber rearward of said firing pin assembly, said arming assembly including a forward rotatable lever containing a first hole for receiving said secondary striker pin and a second hole containing a firing ball; and a rearward rotatable lever containing a first hole for receiving said secondary striker pin, a second hole containing a firing ball and a third hole for receiving a detent pin of the setback assembly; each lever containing a pivot means, which after withdrawal of said pins from said holes, permits rotation of the lever in response to centrifugal force to the armed position, wherein said firing balls are aligned with said striker pin;

a setback assembly disposed in said chamber rearward of said arming assembly, said setback assembly including a first longitudinal channel, a second longitudinal channel, a radial channel connecting said first and second channels, a setback pin and compression spring disposed in said first channel, a detent pin containing an annular groove and a compression spring disposed in said second channel, and a locking ball disposed in the radial channel between said pins and extending into the annular groove for holding the detent pin in said hole in the rear arming lever, said setback pin being responsive to setback force to move rearward to free said locking ball and thereby permit the detent pin to withdraw from from said hole in the rear arming lever; and

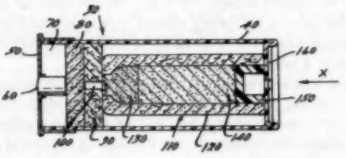
an explosive composition including a primer disposed in the chamber rearward of the arming assembly, said composition being ignited by impact of the firing balls with said primer by axial movement of the first and second striker pins, the firing balls being placed in axial alignment with the primer and the firing pins by movement of the arming levers of said arming assembly.

4,457,233

AERIAL BOMB

Marshall Hyde, 1344 Griswold, Port Huron, Mich. 48060

Filed Sep. 29, 1982, Ser. No. 427,526
Int. Cl.³ F42B *7/00*
U.S. Cl. 102—346 **1 Claim**



1. A delayed-exploding aerial bomd for use in a shotgun comprising:

(a) an elongated generally hollow cylindrical shotgun shell casing having at least a portion thereof composed of a substantially transparent material;

(b) a flanged base for said shotgun shell casing enclosing one end thereof, said base including a shotshell primer and an annular plug surrounding said primer;

(c) an ignitable propellant powder charge inside said shotgun shell casing generally adjacent said flanged base and in contact with both said shotshell primer and said annular plug;

(d) a symmetrical generally disc-shaped annular wad inside said shotgun shell casing generally adjacent said propellant powder charge, said wad having an empty opening extending therethrough generally in a longitudinal direction relative to said shotgun shell casing, said wad further being reversibly insertable into said shotgun shell casing and being of a diameter so as to maintain a continuous peripheral sealing contact with the adjacent inner surface of said shotgun shell casing in either of its reversibly inserted orientations therein;

(e) a projectile inside said shotgun shell casing with no physical contact between said projectile and said propellant powder charge, said projectile including a generally hollow cylindrical tube having two open ends and being of a uniform diameter substantially less than the inner diameter

of said shotgun shell casing so as to prevent continuous peripheral contact between said tube and said casing, said projectile further including ignitable fuse means at one open end of said tube an ignitable explosive charge within said tube, and a closure cap sealingly disposed at the other open end of said tube, said fuse means including a mass of compacted black powder disposed within said tube adjacent said one open end of said tube and extending longitudinally only inwardly from said one open end such that said compacted black powder is spaced from said propellant powder charge, at least a portion of said closure cap having a color that substantially contrasts with the compacted black powder end of said charge end of said projectile, said explosive charge being disposed within said tube between said closure cap and said fuse means, said one open end and said opening in said wad being adjacent one another and providing communication between said propellant powder charge and said compacted black powder when said tube is properly oriented within said shotgun shell casing in order to allow a quantity of hot gases to flow through said opening in said wad and to ignite said compacted black powder when said propellant powder charge is ignited; and

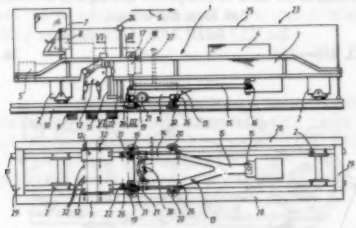
(f) said shotgun shell casing further including releasable closure means at the end of said shotgun shell casing opposite said base, at least said closure means including said substantially transparent portion of said shotgun shell casing in order to permit visual observation of said closure cap to determine whether said projectile has been properly oriented inside said casing with said fuse means generally adjacent said wad.

4,457,234

TRACK LIFTING AND LINING DEVICE

Josef Theurer, Vienna, and Johann Pichler, Strassham, both of Austria, assignors to Franz Plasser Bahnbaumaschinen Industrie Gesellschaft m.b.H., Vienna, Austria

Filed Apr. 13, 1981, Ser. No. 253,105
Claims priority, application Austria, May 29, 1980, 2871/80
Int. Cl.³ E01B *27/17*
U.S. Cl. 104—7 B **13 Claims**



1. A mobile track leveling and lining machine arranged for mobility on the rails of a track in an operating direction and comprising a frame and a track lifting and lining device comprising

(a) a rigid tool carrier extending in the direction of the track and including a tool carrying portion having the form of a bifurcated yoke and a rigid pulling member integral with, and rigidly connected to, the tool carrying portion, the pulling member being a pole extending substantially centrally between the track rails in the direction thereof and having a free end directly linked to the frame for universal pivoting movement,

(b) a track lifting tool associated with each track rail and mounted on the tool carrying portion,

(c) a single pair of flanged wheels mounting the tool carrier on a common axle for mobility on the track rails,

(d) a power-actuated lifting drive associated with each track rail and linking an end of the tool carrier opposite the free end for universal pivotal movement in all directions to the frame, the lifting drives being arranged to lift the track substantially vertically in relation to the track and the flanged wheels being arranged on the tool carrying portion between the lifting drives and the free end of the rigid pulling member, and

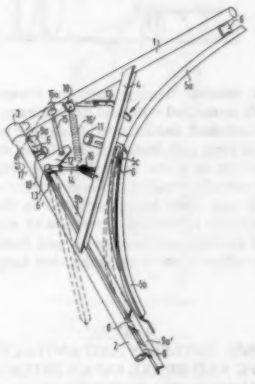
(e) a power-actuated lining drive linking the tool carrier to the frame and arranged to move the track in a transverse direction.

4,457,235

SWITCH FOR SUSPENDED TRACK APPARATUS

Franz Fottner, Hilgertshausen, Fed. Rep. of Germany, assignor to Velt Bekleidungs-Technik GmbH & co., Landsberg, Fed. Rep. of Germany

Filed Dec. 16, 1981, Ser. No. 331,313
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048384
Int. Cl.³ E01B *25/26*
U.S. Cl. 104—104 **14 Claims**



1. A switch for a suspended track transport apparatus which includes tracks for receiving the rollers of trollies and wherein said tracks are fastened by spacer elements to supports, said switch comprising a support structure which includes two support tubes connected together at an angle with each other and a cross brace connected between the two support tubes, at least one fixed track section supported by each of the support tubes at a vertical distance as small as possible, at least one curved movable track section and at least one straight movable track section, a dead space enclosed by sides extending along said two support tubes and said cross brace and having a height which does not exceed the vertical distance from the support tubes to respective fixed track sections supported by respective support tubes, first pivot means located at a first pin at point disposed entirely within said dead space and connected to said straight movable track section for movably supporting the movable straight track section, second pivot means located at a second pivot point disposed entirely within said dead space and connected to said movable curved track section for movably supporting said movable curved track section, lever means disposed entirely within said dead space coupled to said straight movable track section and said curved movable track section and cooperating with said first pivot means and said second pivot means for moving the movable track sections from one switch position in which the trollies may proceed along one path between fixed track sections and another switch position in which the trollies may proceed along another path between fixed track section, and wherein the lever means and the first and second pivot means are disposed so that

the lever means engages the movable track sections in the immediate vicinity of the first and second pivot points.

4,457,236

PIPE INTERNAL TOWING CARRIAGE

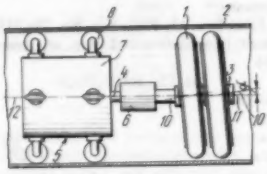
Galimzyan M. Akhmadiev, ulitsa Lenina, 75, kv. 1., Almetievsk; Ilya A. Buvailo, ulitsa Gagarina, 105, kv. 35., Kazan; Vasily M. Morgun, ulitsa Dekabristov, 93, kv. 12., Kazan; Felix I. Mutin, ulitsa Komarova, 24, kv. 20., Kazan, and Petr I. Yastrebov, ulitsa Korolenko, 23, kv. 29., Kazan, all of U.S.S.R.

Filed Feb. 9, 1982, Ser. No. 347,120

Claims priority, application U.S.S.R., Feb. 24, 1981, 3254159

Int. Cl.³ B61B *13/10*

U.S. Cl. 104—138 G **9 Claims**



1. A pipe internal towing carriage comprising: a drive means; a shaft connected with said drive means; friction rollers mounted on said shaft and intended to engage with the interior surface of said pipe; said friction rollers being mounted on said shaft successively in a row such that their respective axes of rotation are mutually parallel and intersect the axis of rotation of said shaft; said shaft being provided in the area thereof where said friction rollers are secured with stepped portions, each stepped portion carrying one of said friction rollers and being axially offset relative to each other lengthwise of said shaft.

4,457,237

ELECTRONIC ANTI-SPIN AND ANTI-SLIP CONTROL FOR DRIVE AND BRAKE OF AN INTERMITTENTLY ADVANCING TRACK WORKING MACHINE

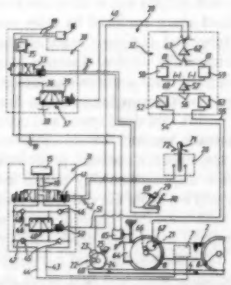
Josef Theurer, Vienna; Mihir Ganguly, Linz; Gernot Böck, Aschach, and Wilhelm Praschl, Linz, all of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft mbH, Vienna, Austria

Filed Aug. 24, 1981, Ser. No. 295,491

Claims priority, application Austria, Oct. 8, 1980, 5003/80

Int. Cl.³ B60T *8/10*

U.S. Cl. 105—61 **4 Claims**



1. A mobile track working machine arranged for intermittent advancement along the track consisting of two rails fastened to ties and comprising undercarriages with wheels engaging the rails, drive means connected to at least some of the wheels for driving the wheels, brake means for braking the driven wheels at respective working sites between the intermittent advancement of the machine, the drive means and the brake means each including an electro-hydraulic proportional valve respectively controlling the drive and brake means, means for measuring the speed of advancement of the machine, the advancement speed measuring means including means for generating a signal indicating the speed of advancement, means for measuring the peripheral speed of the driven wheels, the peripheral speed measuring means including means for generating a signal indicating the peripheral speed, and a fully electronically operated control arrangement for avoiding spinning of the driven wheels at the start of the advancement of the machine and locking of the wheels at braking, the control arrangement including an electronic circuit having electronic input signal receiving elements respectively connected to the advancement speed and peripheral speed indicating signal generating means and receiving the signals indicating the speed of advancement of the machine and the peripheral speed of the driven wheels, an electronic difference member connected to the input signal receiving elements and arranged to emit a positive signal indicating drive slippage and a negative signal indicating brake slippage, electronic control units connected to the difference member for respectively receiving the positive and negative signals and for dynamically influencing the positive and negative signals, and an electronic output signal element receiving the signals from the electronic control units and transmitting a slippage value output signal corresponding to the difference between the input signals to the valves controlling drive means and the brake means, the control valves being responsive ot the output signals for constantly maintaining the nominal desired value of the drive and brake moments and for reducing the traction and brake forces in dependence on any drive or brake slippage.

4,457,238

RAILWAY TRUCK; PIVOTAL CONNECTION

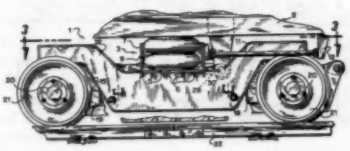
George Sobolewski, Laval West, Canada, assignor to Urban Transportation Development Corporation Ltd., Toronto, Canada

Continuation of Ser. No. 890,318, Mar. 27, 1978, Pat. No. 4,221,172. This application Sep. 4, 1980, Ser. No. 184,150

The portion of the term of this patent subsequent to Sep. 9, 1980, has been disclaimed.

Int. Cl.³ B61F *3/08, 5/22, 5/44*

U.S. Cl. 105—168 **24 Claims**



1. A steerable truck to support a body of a vehicle comprising a pair of transverse wheelsets spaced along a longitudinal axis and each rotatable about a respective transverse axis, a pair of yokes each supported by a respective wheelset, said yokes being interconnected for relative movement about a vertical pivot axis, a pair of side frames disposed on opposite sides of said pivot axis and each extending between and supported upon said yokes, means to permit relative movement between said side frames and said yokes to accommodate relative pivotal movement of said yokes about said pivot axis, lateral link means extending between at least one of said yokes and said side frames to locate said side frames relative to said yokes, said link means including connecting means to accommodate relative longitudinal movement between said yoke and said side frames and independent vertical movement of one side frame relative to the other upon tilting of said yoke, a support means to support said vehicle body upon said side frames intermediate

said axle assemblies and permit rotation of said vehicle body relative to said side frames and means to transfer draft loads from said body to said truck.

4,457,239

SHELVING SYSTEM AND ITS PRODUCTION PROCEDURE

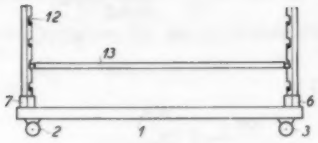
Bjarne C. Heinze, Hasselvej 15, 2740 Skovlunde, Denmark

Continuation of Ser. No. 76,183, Sep. 17, 1979. This application Jun. 2, 1981, Ser. No. 269,482

Claims priority, application Denmark, Sep. 22, 1978, 4201/78

Int. Cl.³ A47B 9/00

U.S. Cl. 108—109 **9 Claims**



1. A rack for detachably mounting shelf members which may be moved horizontally into and out of an assembled position, said members having two vertical parallel side wall edge portions, said rack comprising at least four vertical uprights, each upright having adjacent side walls defining a generally V-shaped vertical portion with a vertical vertex line and a series of vertically spaced hook-shaped cutouts therein, each cutout being symmetrically disposed about the vertex line of said V-shaped portion and having a vertically oriented notch in each of said side walls, for receiving and supporting part of said vertical side wall edge portion of a shelf member to be mounted to said rack, a first pair of said uprights being disposed so that all four notches thereof are in a straight line parallel to one of said side wall edge portions, and a second pair of said uprights being disposed so that all four notches thereof are in a straight line parallel to the other of said side wall edge portions, whereby said notches act as glides for said members shelf members so that each shelf members can slide into and out of said rack but, once in the rack is held in said assembled position.

4,457,240

HAND HELD AND/OR HARD MOUNTED WEATHERPROOF PORTABLE TRAVEL SAFE FOR FULL TIME PROTECTION OF ESSENTIAL TRAVEL VALUABLES

Robert E. Hungerford, P.O. Box 66158, Seattle, Wash. 98166

Filed Jun. 25, 1982, Ser. No. 392,171

Int. Cl.³ E05G 1/00

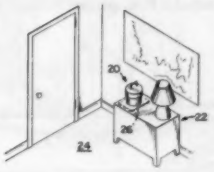
U.S. Cl. 109—45 **12 Claims**

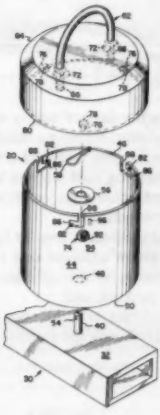
1. A hand carried and/or hard mounted, strong, lockable, weatherproof, portable travel safe used by travelers to keep their essential valuables under their personal control enroute to and from a destination and while staying there, or just staying there, comprising:

(a) a strong cylindrical compartment with a full top entry, having about its top edge multiple circumferentially spaced drop in and turn receiving slots and having an integral inside radially projecting abutment pin located adjacent one of the spaced drop in and turn receiving slots;

(b) a first rotatable then lift off strong cover fully fitting over the full top entry to complete a weatherproof compartment, having about its interior multiple circumferentially spaced integral radially projecting locking pins, each having integral enlarged heads, whereby these locking pins are dropped in and turned in the spaced drop in and turn receiving slots, when the first rotatable then lift off strong cover is fully fitted over the full top entry of the strong cylindrical compartment; and

(c) a locking mechanism essentially secured to the strong cylindrical compartment having a rotatable locking pawl, which after the drop in and turn of the strong cover, is rotated past one of the integral radially projecting locking pins of the strong cover, and into contact with the integral inside radially projecting abutment pin of the strong cylindrical compartment, whereby, when the locking mechanism is internally secured to prevent its rotation and consequently also the rotation of the rotatable locking pawl secured to it, the strong cover is firmly and securely locked on the strong cylindrical compartment, because thereafter any attempted relative first rotation of the strong cover is prevented by the overall arrangement of the locking pawl, which is then located between the integral inside radially projecting abutment pin and the nearest one of the integral radial projecting locking pins, and thereafter any access is prevented to all the valuable contents placed in the strong cylindrical compartment of this travel safe.





4,457,241

METHOD OF BURNING PULVERIZED COAL

Daniel C. Itse, Worcester, and Craig A. Penterson, Sutton, both of Mass., assignors to Riley Stoker Corporation, Worcester, Mass.

Division of Ser. No. 333,910, Dec. 23, 1981, abandoned. This application Feb. 23, 1983, Ser. No. 469,117

Int. Cl.³ F23K 5/00

U.S. Cl. 110—347 **6 Claims**

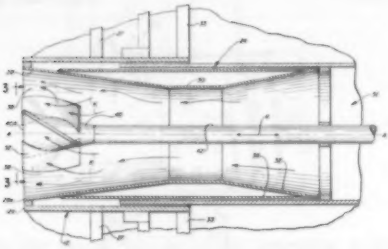
1. A method of burning pulverized coal and othe fuels comprising the steps of:

containing a primary flowing stream of coal/air mixture received adjacent an inlet end of tubular nozzle means for discharge at an outlet end into a combustion zone of a furnace for burning;

accelerating said stream of coal/air mixture in a convergent venturi section upstream of said outlet end of said nozzle means to concentrate the coal particles toward a central portion of the stream in a minimum throat area of said venturi;

decelerating said flowing stream downstream of said throat in a divergent flow section of said venturi while forming an annular, shallow sloping conically shaped flow pattern around an imperforate wall surface of a spreader cone in said divergent section and having a hollow outer end adjacent said outlet end of said nozzle means;

causing said annular flow pattern to swirl around the axis of



said cone outwardly thereof within said convergent flow section of said venturi forming a stable, annularly-shaped, flow pattern discharging into said combustion zone;

burning said discharging coal with an elongated flame pattern in said combustion zone extending along said stabilized conical flow pattern;

forming a shielded stagnation area of high temperature and reducing atmosphere adjacent said hollow outer end of said cone for driving off the volatiles in said coal early in the combustion process; and

burning off said volatiles in a reducing zone in a continuing burning process reducing the formation of oxides of nitrogen.

4,457,242

APPARATUS FOR POSITIONING THE WORKHOLDER OF AN AUTOMATIC SEWING MACHINE

Eric W. Nordstrom, Forest Park, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed Sep. 18, 1981, Ser. No. 303,651
Int. Cl.³ D05B *21/00*
U.S. Cl. 112—121.12 **13 Claims**

3. An automatic sewing machine having a pattern generation control system comprising:

a sewing needle;

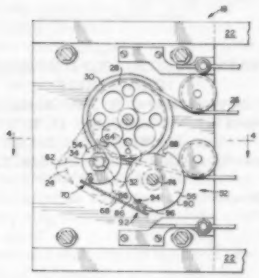
a workholder for holding a workpiece to be sewn;

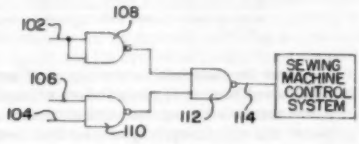
first driving means adapted to move the workholder in a first coordinate direction;

second driving means adapted to move the workholder in a second coordinate direction;

a homing assembly for positioning said workholder in a predetermined home position regardless of its starting position, said homing assembly being driven in positional synchronism with movement of the workholder in the first coordinate direction, said homing assembly comprising:

operative means including workholder direction and position indicator means connected to and driven by one of said driving means for continually determining direction and the position of said workholder anywhere within the pattern; and





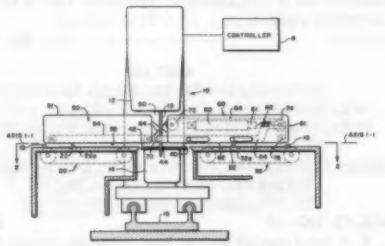
control means operative together with said operative means to stop the workholder at a predetermined home position.

4,457,243

AUTOMATED SEAM JOINING APPARATUS

Philip N. Bowditch, Cohasset, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Feb. 4, 1982, Ser. No. 345,756
Int. Cl.³ D05B *3/00, 27/10*
U.S. Cl. 112—121.14 **8 Claims**



6. A system for orienting a strip of material with respect to a linear movable seam joining head, comprising:

at least two sets of opposed belts and associated support structures on each side of the locus of said seam joining head, wherein the opposing surfaces of each of said belts are adapted to frictionally engage an adjacent surface of said material, and

wherein one or more of said support structures are two state support structures including means responsive to applied control signals, including means for selectively controlling its associated belt to be in a first state in part overlying an associated portion of the locus of said seam joining head or in a second state outside the locus of said seam joining head, and

further including a controller adapted to generate said control signals whereby each two state support structure is controlled to be in its first state when said seam joining

head is positioned outside the portion of said locus associated with that belt, and to be in its second state when said seam joining head is positioned at least in part within said portion.

4,457,244

ROTARY-GRIPPER COUNTER-HOOK FOR DOUBLE-LOCK-STITCH SEWING MACHINES

Klaus D. Seiler, Kirchlengern; Wilhelm Stapel, Bünde, and Günter Droste, Leopoldshöhe, all of Fed. Rep. of Germany, assignors to Dürkoppewerke GmbH, Bielefeld, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 214,113, Dec. 8, 1980, abandoned, which is a continuation of Ser. No. 5,781, Jan. 23, 1979, abandoned. This application Mar. 23, 1981, Ser. No. 246,413

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1978, 2803971

Int. Cl.³ D05B *1/12, 57/08*

U.S. Cl. 112—184 **7 Claims**

1. In a double-lock-stitch sewing machine having a reciprocating needle feeding an upper thread through a stitch plate to form, with the aid of a rotary gripper assembly therebelow, an upper-thread loop for engagement with a lower thread from a bobbin seated on said gripper assembly, said gripper assembly including a main hook and a counter hook each disposed along the periphery of said gripper assembly said main hook imparting a predetermined length to said upper-thread loop and said counter hook guiding said upper-thread loop upon its release by said main hook, the improvement which comprises means including an auxiliary hook portion formed upon an underside of said counter hook and drawing an additional length of said upper thread from a supply thereof into said upper-thread loop during each stitch to inhibit bunching of a workpiece being sewn.

4,457,245

BOBBIN WINDING ACTUATION BY PRESSER FOOT UP SWITCH

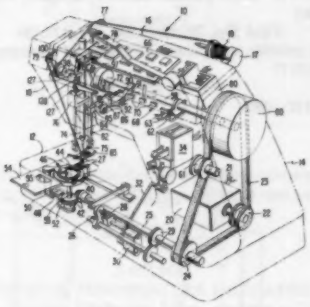
Charles R. Odermann, Montville, N.J., assignor to The Singer Company, Stamford, Conn.

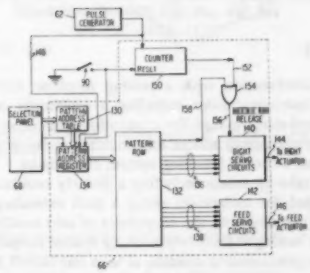
Filed Aug. 24, 1983, Ser. No. 525,909

Int. Cl.³ D05B *69/02, 69/20*

U.S. Cl. 112—221 **3 Claims**

1. A sewing machine comprising: a frame; an endwise reciprocable needle bar supported by said frame; a sewing needle supported by said needle bar; means for selectively actuating said needle bar in endwise reciprocation; means for providing a signal on each endwise reciprocation of said needle bar; means for selectively disconnecting said actuating means from said needle bar to suspend endwise reciprocation of said needle bar while continuing actuation of said actuating means; a presser bar supported by said frame; means for selectively elevating said presser bar; a switch supported for actuation thereof by elevation of said presser bar; means responsive to actuation of said switch, and actuation of said actuating means for a selected number of said signals from said providing





means, for initiating operation of said disconnecting means to suspend endwise reciprocation of said needle bar while continuing actuation of said actuating means.

4,457,246

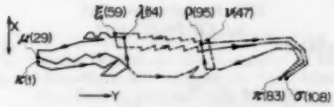
METHOD OF MAKING PATTERN DATA FOR A SEWING MACHINE

Susumu Hanyu; Mikio Inamori, both of Tokyo, and Eiichi Shomura, Hachioji, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1983, Ser. No. 538,413

Int. Cl.³ D05C *17/00*

U.S. Cl. 112—266.1 **3 Claims**



1. The method of producing by a sewing machine a pattern including at least two end stitches arranged at least in alignment with one another in a feeding direction and a plurality of intermediate stitches therebetween, the method comprising the steps of dividing a pattern into a plurality of blocks disposed adjacently in the feeding direction and connected to each other with overlapping parts so that a number of intermediate stitches between end stitches aligned in the feeding direction of each of said blocks is less than the number of intermediate stitches between the end stitches of the pattern; and forming a pattern by making stitches in said blocks successively in one block after the other.

4,457,247
THREAD CONTROL MECHANISM FOR SEWING MACHINES

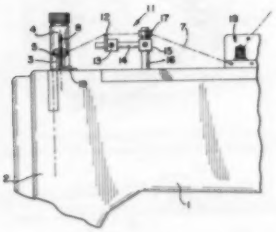
Wolf-Rüdiger von Hagen; Erwin Jürgens, both of Hemmingen, and Helmut Bauer, Stuttgart, all of Fed. Rep. of Germany, assignors to Union Special GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,484

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1981, 3140377

Int. Cl.³ D05B *49/00*

U.S. Cl. 112—302 **8 Claims**



1. In combination with a sewing machine having stitch forming instrumentalities including a reciprocal needle bar, thread tensioning means for controlling the flow of thread from a thread supply source to said stitch forming instrumentalities, and a thread handling system comprising:

thread take-up means including a linearly oscillatable lever adapted for movement along a path extending substantially parallel with the movement of said needle bar, said lever having at least two laterally spaced thread engaging limbs positioned to straddle at least one thread controller; and

a thread controlling mechanism disposed directly in a flow of thread extending between said thread tensioning means and said thread take-up means, said thread controlling mechanism having thread handling means adapted for linear adjustment relative to said thread take-up means in the direction of thread flow such that in varying positions of adjustment said thread handling means cooperates with said thread take-up means to proportion the needle thread to produce varying stitch tightness.

4,457,248
MULTIHULL VESSELS

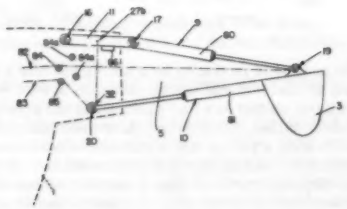
John W. Thurston, P.O. Box 724, Alexandria, Va. 22313

Filed Jun. 25, 1980, Ser. No. 162,908

The portion of the term of this patent subsequent to Jun. 26, 1996, has been disclaimed.

Int. Cl.³ B63B *43/14*

U.S. Cl. 114—39 **11 Claims**



1. A multihull vessel comprising:

a center section,

a pair of floats disposed on opposite sides of the center section and spaced therefrom,

pivot connection means pivotally connecting each float to the center section for movement between:

a first position laterally extended from the center section to render the vessel stable in an upright condition, and

a second position located beneath the center section when the vessel is fully capsized to render the vessel unstable by locating the center of buoyancy of the capsized vessel below the center of gravity to promote righting of the capsized vessel;

power means for moving said pivot connection means between said first and second positions,

the pivot connection means comprising a float arm assembly on each side of the vessel interconnecting the center section and a respective float, each float arm assembly including first and second arm means, said first and second arm means being pivotably attached to said center section at vertically spaced locations,

said first and second arm means each including means for progressively changing the effective length of said first and second arm means as said float moves between said first and second positions.

4,457,249
METHOD OF FABRICATING AN INTEGRAL SHELL FORMED BODY AND THE BODY FORMED THEREBY

Sven R. Disén, Karlskrona, Sweden, assignor to K B Weecan Marine, Holmsjö, Sweden

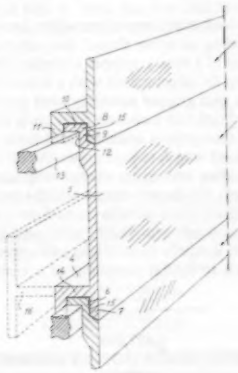
PCT No. PCT/SE81/00211, § 371 Date Mar. 4, 1982, § 102(e) Date Mar. 4, 1982, PCT Pub. No. WO82/00313, PCT Pub. Date Feb. 4, 1982

PCT Filed Jul. 8, 1981, Ser. No. 359,661

Claims priority, application Sweden, Jul. 11, 1980, 8005125; Sep. 17, 1980, 8006517

Int. Cl.³ B63B *3/18*

U.S. Cl. 114—88 **12 Claims**



1. Method of fabricating an integral shell formed body having a substantially even and smooth outer surface from several elongated panels comprising:

providing each of the panels with a substantially U-formed groove element (6) along one longitudinal edge, the groove element being offset from the main plane of the elongated panel and extending in the longitudinal direction of the panel and having a tongue groove of selected depth and width defined therein,

providing each of the panels with a tongue element (8) to mate with the groove of a similar adjacent panel along the other longitudinal edge, the tongue element (8) being offset from the main plane of the panel in the same manner as the groove element and being formed with a leg portion

(9) and a foot portion (10), the length of the leg portion being substantially the same as the depth of the groove adjacent the main plane of the panel and being narrower than the width of the groove to thereby define a clamp groove (12) between the tongue and groove elements when mated in interengaging relationship;

introducing the tongue element (8) of one panel into the groove of another panel with the leg portion (9) in contact with and pressed against one side (7) of the groove (6) extending in the longitudinal direction thereof adjacent the main plane of the panel, and with the foot portion (10) in contact with and pressed against the bottom (14) of the tongue groove;

mounting at least one clamp block (13, 17) in the clamping groove (12) adjacent the tongue element (8) so as to press the tongue element toward both the bottom (14) of the tongue groove and the side of the groove adjacent the main plane (5) of the panel, whereby the main planes of the interconnected panels provide a substantially smooth and even surface at the side opposite the offset tongue and groove elements.

4,457,250

FLOATING-TYPE OFFSHORE STRUCTURE

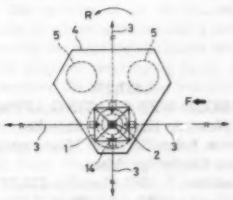
Masanao Oshima, Tokyo, and Hiroshi Tabuchi, Yokohama, both of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1981, Ser. No. 330,820

Claims priority, application Japan, May 21, 1981, 56-75716

Int. Cl.³ B63B *35/44*

U.S. Cl. 114—265 **2 Claims**



1. A floating-type offshore structure adapted to be anchored by mooring lines and comprising a plurality of struts having a buoyancy and a platform supported on said plurality of struts, each of said struts at least partly comprising a downwardly converging frustoconical configuration, one of said struts being rotatably supported by the platform and having said mooring lines passing therethrough.

4,457,251

BELT LOAD INDICATOR

Per O. Weman, Heverlee, Belgium, and Fred F. Neumann, Rochester, Mich., assignors to N. V. Klippan S.A., Haasrode, Belgium

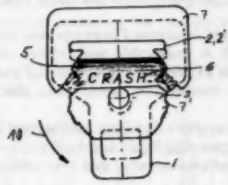
Filed Mar. 2, 1979, Ser. No. 16,861

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1978, 2811199

Int. Cl.³ A44B *21/00*

U.S. Cl. 116—212 **9 Claims**

1. A seat belt restraint sysem indication device for indicating when said seat belt restraint system is subjected to a tensile loading above a predetermined amount, said indication device comprising at least two parts having different tensile strengths, said parts being displaceable with respect to each other upon loading of said indication device in tension above said amount, a first of said parts comprising a metal plate having an opening for communication with said seat belt, a second of said parts comprising a plastic cap which at least partially surrounds said metal plate, said metal plate having indicator means which becomes apparent upon displacement of said parts, said indicator means being of a different color than said cap and/or bearing an indicating legend, said plastic cap being displaced with respect to said metal plate upon said loading of said device and



said plastic cap being provided with at least one weak point about which said cap breaks upon loading of said restraining device above said amount.

4,457,252

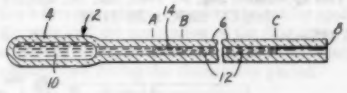
CRITICAL TEMPERATURE INDICATOR

Wendell J. Manske, Birchwood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 9, 1982, Ser. No. 440,264

Int. Cl.³ G01K *11/00*

U.S. Cl. 116—216 **14 Claims**



1. A critical temperature indicator comprising:

a hollow bulb;

a capillary tube communicating with said bulb;

a colorless first liquid filling said bulb and extending into said tube which is capable of solidification and exhibits the property of volume reduction upon solidification;

a second liquid located within said tube which is miscible with said first liquid and has a solidification temperature lower than that of said first liquid; and

separating means interposed between said first and second liquids for preventing mixing thereof within said tube;

the volumes of said first liquid upon solidification and said separating means being less than the volume of said bulb so that said separating means and at least a portion of said second liquid are drawn into said bulb upon solidification of said first liquid to provide a visual indication that said first liquid has solidified.

4,457,253

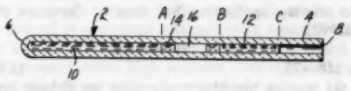
CRITICAL TEMPERATURE INDICATOR

Wendell J. Manske, Birchwood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 9, 1982, Ser. No. 440,265

Int. Cl.³ G01K *11/00*

U.S. Cl. 116—216 **16 Claims**



1. A critical temperature indicator comprising:

a capillary tube closed at one end;

a first liquid extending from said closed end partially throughout said tube which is capable of solidification and

exhibits the property of volume reduction upon solidification;

a colored second liquid located within said tube which has a solidification temperature lower than that of said first liquid;

a separating liquid interposed between said first and second liquids which is immiscible with either of said first or second liquids to prevent mixing thereof and which has a solidification temperature lower than that of said first liquid; and

a porous plug capable of sorbing said second liquid located within said separating liquid and frictionally engaging said tube to prevent movement of said plug with respect to said tube;

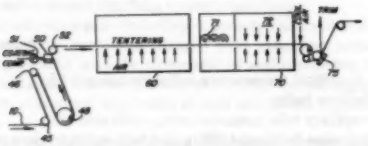
the volumes of said first liquid and said separating liquid being such that contact between said second liquid and said plug is prevented prior to solidification of said first liquid and solidification of said first liquid draws said second liquid into said plug to color said plug and provide a visual indication that said first liquid has solidified.

4,457,254

FILM COATING AND BIAXIAL ORIENTING APPARATUS

Gordon P. Hungerford, Palmyra, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 235,887, Feb. 19, 1981, Pat. No. 4,388,258
This application Sep. 30, 1982, Ser. No. 429,371
Int. Cl.³ B05C *3/20, 11/00*
U.S. Cl. 118—34 **4 Claims**



1. A continuous film coating and biaxial orienting system adapted for manufacturing polymer film comprising

means for feeding a continuous film comprising orientable thermoplastic polymer to a first uniaxial stretching unit; said first uniaxial stretching unit having differential speed roll means for machine direction orientation of the film;

coating means operatively connected to receive film from the first stretching means, said coating means being adapted to provide a liquid coating composition continuously to the film surface in a centerband;

second uniaxial stretching means for transversely orienting the coated film and having edge handling means for holding the film during stretching; and

heater means for curing the coating composition including means for holding the biaxially oriented and coated film under constrained conditions during setting of the film.

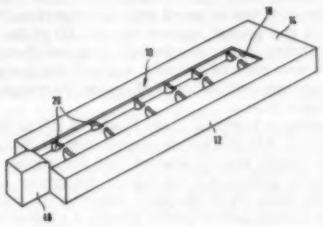
4,457,255

SKI WAXING MACHINE

Peter M. Amann, Magnusstrasse 25, D-8960 Kempten-St. Mang. Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 516,958
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1982, 3227922
Int. Cl.³ B05C *1/02*
U.S. Cl. 118—72 **10 Claims**

1. A ski waxing machine comprising an oblong housing, supporting elements arranged within said housing supporting the skis while being worn by the user, means for cleaning snow from the running surfaces of the skis, means for conditioning the running surfaces for receiving wax and means for applying a coating of wax, said means arranged in the housing, driving means for causing a relative movement in the longitudinal direction of the skis beween said skis and at least said means for applying a wax coating, said driving means comprising a guide block guided in the longitudinal direction within the housing for a reciprocating motion, at least said means for applying wax mounted at said guide block, said supporting elements



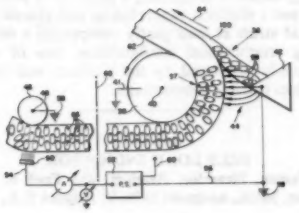
provided in the moving path of the guide block and movably arranged between a supporting position inside of the moving path of the guide block and a rest position outside thereof respectively the supporting elements moved into their rest positions upon approach of the guide block respectively.

4,457,256

PRECHARGED WEB COATING APPARATUS

Semyon Kisler, Newton; Edwin A. Chirokas, Lexington, and Donald A. Foster, Lakeville, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 5, 1981, Ser. No. 222,331
Int. Cl.³ B05B *5/02;* **B05C** *5/02*
U.S. Cl. 118—621 **16 Claims**



1. Electric coating-gap assist apparatus comprising:

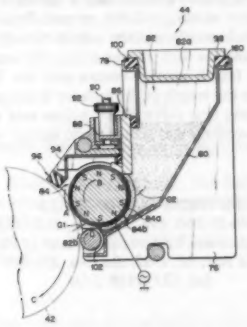
support means for supporting charge-retaining material having a predetermined dipole-type electrostatic charge for producing a corresponding electrical potential; and

a coating applicator for applying coating material to said charge-retaining material, said coating applicator being mounted in spaced relation to said support means and including means for providing an electrical potential different from said predetermined charge potential, so as to produce an electric field between said charge-retaining material on said support and said applicator by virtue of the proximity of said dipole-type electrostatic charge of said charge-retaining material to said different potential applicator, to thereby assist in depositing said coating material on said charge-retaining material.

4,457,257
DEVELOPING DEVICE

Reiji Murakami, Yokohama; Shinichi Hashimoto, Fujisawa, and Yoshiaki Tamura, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 27, 1983, Ser. No. 517,744
Claims priority, application Japan, Jul. 30, 1982, 57-133564
Int. Cl.³ G03G *15/09, 21/00*
U.S. Cl. 118—652 19 Claims



1. A developing device which comprises developing means disposed at a fixed position to oppose an electrostatic latent image-forming surface travelling in one direction, the developing means supplying a magnetic developing agent by a magnetic force to that portion of an electrostatic latent image which opposes the developing means and is defined as a developed area to develop the electrostatic latent image in the developed area by the magnetic developing agent, and

a magnetic member disposed to be parallel to the electrostatic latent image-forming surface, to have an axis perpendicular to said one direction, and to oppose the developed area opposing the developing means at a downstream side from the developing means along said one direction, the magnetic member having a plurality of segments such that different magnetic poles thereof alternately appear along the axis of the magnetic member to remove unnecessary particles of the magnetic developing agent which are deposited on that portion of the image-forming surface on which the electrostatic latent image has been developed by the developing means.

4,457,258
MARKING APPARATUS FOR PAINTS AND INKS

Eric H. Cocks, 6788 NW. Seventeenth Ave., Ft. Lauderdale, Fla. 33309

Filed Jan. 4, 1983, Ser. No. 455,591
Int. Cl.³ B05C *3/109*
U.S. Cl. 118—694 3 Claims

1. An insulated wire marking apparatus comprising

a plurality of containers holding liquids of different colors;

a container holding a solvent for the liquids of different colors;

a mixing chamber;

means connecting the containers holding the liquids of different colors and the container holding the solvent to the mixing chamber;

agitator means located within the mixing chamber;

applicator means for applying the colored liquids to an insulated wire;

means connecting the mixing chamber to the applicator means;

a housing for the applicator means;

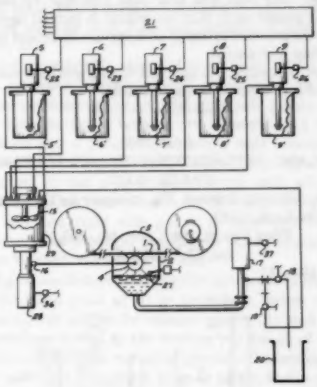
means for moving insulated wire past the applicator means through the housing;

a disposal tank;

discharge means for emptying the housing of excess liquid from the applicator means;

means selectively connecting the discharge means to either the disposal tank or the mixing chamber; and

control means for operating the various means in selective order;

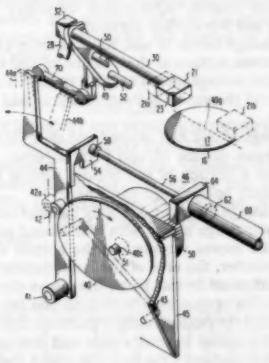


whereby a first desired color may be selected for application to the wire and the application of the first color may be discontinued and a second color applied with a minimum of elapsed time during the changeover period.

4,457,259
APPARATUS FOR SPRAYING A LIQUID ON A SPINNING SURFACE

Gerard Samuels, Paoli, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 14, 1983, Ser. No. 475,035
Int. Cl.³ B05B *3/18, 3/14*
U.S. Cl. 118—705 5 Claims



1. In a system for automatically spraying liquid on a device surface rotated at a constant rate including means for moving a spray nozzle over said surface whereby the liquid is dispensed in a spray under high pressure over said surface along a reciprocating linear path, characterized by:

cam means for moving said nozzle a plurality of times over said surface along said reciprocating diametric path at a predetermined velocity of nozzle movement;

said cam means including spring biased means for keeping a continuously rotating cam in engagement with a cam follower during a first time period; and

means for automatically interrupting said reciprocating action at predetermined intervals to discontinue the movement of said nozzle over said surface; and to position the nozzle at a rest position away from said surface;

said interrupting means including means to disengage said cam follower from said cam, and, subsequently, to reengage said cam and said cam follower by said spring biased means such that the nozzle is moved rapidly from said rest position towards said surface to repeat said reciprocating movement;

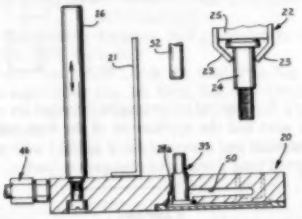
whereby said surface is sprayed with a predetermined quantity of liquid per unit surface area.

4,457,260

SEALANT APPLICATOR FOR MULTI-LENGTH FASTENERS

George W. Johnson, Smyrna, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Feb. 9, 1983, Ser. No. 465,096
Int. Cl.³ B05C 9/02
U.S. Cl. 118—711 4 Claims



1. A sealant applicator assembly for mounting on an automatic multi-length fastener installation machine including a movable fastener gripping and installation mechanism and an adjustable valve actuation means, said assembly comprising:

a body member having at least one bottom surface portion and at least one top surface portion;

a first and second passage means in said body member, each of which extends substantially vertically between said bottom and top surface portions;

a third passage means in said body member extending from said bottom surface to the exterior of said body member, said third passage means adapted to have a sealant supply connected thereto to deliver sealant to said third passage means;

the openings of said first, second and third passage means in the bottom surface of said body member being spaced whereby a portion of the bottom surface is located between each opening and the others;

a fourth passage means in said body member interconnecting said first passage means with said second passage means;

a base plate means mounted to the bottom surface of the body member, the area of the body member bottom surface confronted by said base plate means encompassing no less than the openings of the first, second and third passage means and the bottom surface portions therebetween;

a first valve means located within said first passage means which is actuable by the tip of the shank end of a fastener held by said fastener gripping and installation mechanism being forcibly inserted into said first passage means from the upper surface portion of the body member;

a second valve means located within said second passage means which is actuable by the valve actuation means of the fastener installation machine when the valve actuation means is in contact with said second valve means proximate the upper surface portion of the body member and there is relative approaching movement between the valve actuation means and said upper surface portion of the body member;

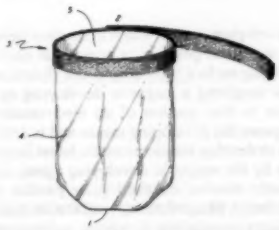
and a fifth passage means in said assembly interconnecting said first, second and third passage means whereby sealant may flow from the sealant supply to the fastener shank located in the first passage means by one of two flow paths depending upon the length of the fastener the sealant is to be applied to; the first flow path being sequentially from the sealant supply through the third passage means, the fifth passage and the first passage means when the length of the fastener is great enough to actuate said first valve means before said valve actuation means contacts said second valve means; and the second flow path being sequentially from the sealant supply through the third passage means, the fifth passage means, the second passage means, the fourth passage means and the first passage means when the length of the fastener is not great enough to actuate said first valve means before said valve actuation means contacts and actuates said second valve means.

4,457,261

MITTENS FOR CANINES

Tina Marshall, 144-19 38th Ave., Flushing, N.Y. 11354, assignor to Bruce Marshall and Tina Marshall, both of Flushing, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,853
Int. Cl.³ A43B 3/00
U.S. Cl. 119—1 7 Claims



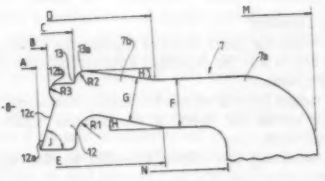
1. A mitten for canines which comprises a tube tapered-off at least near the closed bottom and having attached around the open top a strip of self-gripping material capable of securing said top to the canine, said tube being made of a light-weight, waterproof, flexible latex material having a soft inside surface and an anti-slip outside surface, substantially the entire outside of the latex material having said anti-slip surface.

4,457,262

MILKING INFLATIONS

Geoffrey S. Mills, Walton Park, Walton, Waikato, New Zealand

Filed Aug. 20, 1982, Ser. No. 410,076
Claims priority, application New Zealand, Sep. 7, 1981, 198284
Int. Cl.³ A01J 5/08
U.S. Cl. 119—14.47 13 Claims



1. In a flexible milking inflation of the type having a teat-engaging mouth end portion and being adapted for disposition within a rigid teat cup shell to which pulsating air vacuum is

applied, the improvement comprising a flexible, resilient teat-engaging collar disposed at the mouth end portion of the inflation, said collar having an inner annular portion surrounding the inflation mouth shaped to form an inner depending flange portion defining at least in part an inverted frustro-conical face, said depending flange portion being further shaped to form at least three uninterrupted annular sealing surfaces engageable with the teat; the shape of the collar and disposition of said sealing surfaces being such that an air/vacuum sealing contact with the teat is maintainable by at least two of the three surfaces under flexing or deflecting of the collar up and down relative to the remainder of the inflation and the teat during milking.

4,457,263
ANIMAL ENCLOSURE

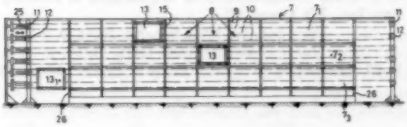
Bertrand Cassou, Saint Symphorien les Bruyères, 61300 L'Aigle, France

Filed Jun. 16, 1982, Ser. No. 389,050

Claims priority, application European Pat. Off., Apr. 27, 1982, 82400753

Int. Cl.³ A01K *31/02*

U.S. Cl. 119—17 **16 Claims**



1. An animal enclosure comprising at least one loop extending along a path, an array of compartments each presenting a compartment opening along which said path extends, a frame having a frame opening through which an animal can pass, said loop having two ends secured to opposite sides of said frame, said loop and said frame being displaceable along said path so as to successively position said frame adjacent a one of said compartment openings and permit passage of an animal to or from the compartment opening located adjacent said frame opening through said frame opening, part of said loop extending across at least one of said compartment openings not located adjacent said frame opening to inhibit passage of an animal to or from said at least one compartment opening.

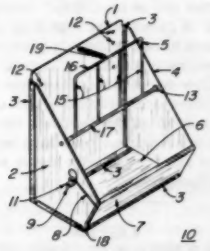
4,457,264
COLLAPSIBLE AND PORTABLE MANGER

Marie L. Maier, 935 Sprague, Buhl, Id. 83316

Filed Aug. 10, 1981, Ser. No. 291,279

Int. Cl.³ A01K *5/01*

U.S. Cl. 119—58 **1 Claim**



1. A collapsable and portable manger comprising:

a back plate disposed in a substantially verticle position; and left and right side plates rotatably attached to the left and right sides of the back plate for outward extension therefrom for use as a manger or for storage in a collapsed position against the back plate, wherein each side plate has in it a hole for receiving in pivotal relation the bottom rail of a hay rack at a height suitable to allow animals to feed beneath it; and

a bottom plate rotatably attached to the bottom of the back plate for outward extension therefrom for use as a manger or for storage in a collapsed position against the back plate; and

a front plate rotatably attached to the front of the base plate for extension therefrom for communication with the lower portions of the left and right side plates; and

a hay rack having a bottom rail disposed in a horizontal position and a polarity of verticle rails attached to and extending upwardly from the bottom rail and a swing rail attached to the tops of the verticle rails wherein said bottom rail has ends suitable for insertion into the holes of the left and right side plates in pivotable relationship therewith at a height suitable to allow animals to feed from beneath the hay rack; and

a spring removable connecting the swing rail of the hay rack to the back plate so as to provide a means of holding animal feeds within the manger against the back plate; and

collarstops attached to the bottom rail inside of the points where the bottom rail is in pivotal relationship with the left and right side plates so as to preclude the collapse of the left and right side plates when the hay rack is installed between the left and right side plates; and

tabs extending upwardly from the sides of the bottom plate, when the bottom plate is in its extended position and in communiction with the left and right side plates, wherein said tabs are also in communication with the outsides of the left and right side plates so as to preclude the outward movement of the left and right side plates; and

tabs extending inward from the sides of the frontal plate, when the frontal plate is in its extended position and in communication with the left and right side plates, wherein said tabs are also in communication with the outsides of the left and right side plates so as to preclude the outward movement of the left and right side plates; and

pins flexibly attached to the front plate for removable attachment to the side plates for holding the front plate against the side plates in a position wherein the bottom plate is also in communication with the bottom of the left and right side plates.

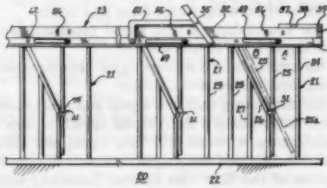
4,457,265
SELF-LATCHING STANCHION AND SYSTEM FOR CATTLE AND THE LIKE

Bernard O. Anderson, 5341 Banff La., Glendale, Ariz. 85301

Continuation-in-part of Ser. No. 313,133, Oct. 20, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 419,997

Int. Cl.³ A01K *1/06*

U.S. Cl. 119—148 **18 Claims**



1. A latching and release system for cattle stanchions comprising a fixed stanchion, first means for supporting said fixed stanchion at its upper end, second means for supporting said stanchion at its lower end, a release stanchion located adjacent said fixed stanchion to define a head opening for an animal, said release stanchion having an upper portion and a lower portion

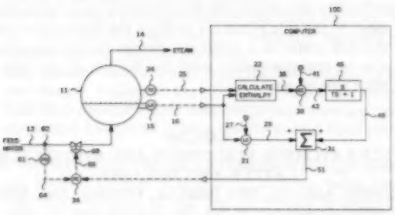
for actuating said release stanchion, said upper portion being adapted to be latched, mounting means attached at least to said first means mounting said release stanchion for pivotal movement between open and closed positions, said upper portion in said open position being pivoted away from said fixed stanchion to enlarge the upper part of said head opening and thereby enabling an animal to place its head through said head opening, said lower portion in said open position being located in said head opening for engagement by the neck of an animal with its head in said upper part of said head opening, said upper portion in said closed position being pivoted toward said fixed stanchion to narrow the upper part of said head opening, said lower portion being operative to pivot said release stanchion to said closed position upon movement of the animals neck against said lower portion and into the lower part of said head opening; latching means attached to said first means for releaseably engaging the upper end of said upper portion of said release stanchion in a closed position, actuating means attached to said first means for actuating said latching means to a release position for enabling release of said release stanchion, and operating mechanism movable relative to said first means for operating said actuating means between latching and release positions of said latching means, said latching means comprises a U-shaped member having two connected legs one of which is pivotally mounted in said first means and the other of which is movable downwardly under the force of gravity to a releasable stanchion latching position and upwardly to a release position, and said actuating means comprises and arm having an upper end attached to the pivotal leg of said U-shaped member and a depending lower end for engagement by said operating mechanism.

4,457,266

BOILER CONTROL

Ronald J. La Spisa, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 2, 1983, Ser. No. 519,654
Int. Cl.³ F22D *5/26*
U.S. Cl. 122—451.1 **6 Claims**



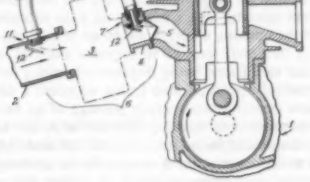
1. Apparatus comprising:
a boiler;
means for supplying feedwater to said boiler;
means for withdrawing steam from said boiler
means for establishing a first signal representative of the actual liquid level in said boiler;
means for establishing a second signal representative of the desired liquid level in said boiler;
means for comparing said first signal and said second signal and for establishing a third signal which is responsive to the difference between said first signal and said second signal, wherein said third signal is scaled so as to be representative of the flow rate of said feedwater required to maintain the actual liquid level in said boiler substantially equal to the desired liquid level represented by said second signal;
means for establishing a fourth signal representative of the actual enthalpy of the fluid in said boiler;
means for establishing a fifth signal representative of the desired enthalpy which the fluid in said boiler would have if the actual liquid level in said boiler were equal to the liquid level represented by said second signal;
means for comparing said fourth signal and said fifth signal and for establishing a sixth signal which is responsive to the difference between said fourth signal and said fifth signal, wherein said fifth signal is scaled so as to be representative of a change in the flow rate represented by said third signal required to maintain the actual enthalpy in said boiler substantially equal to the desired enthalpy represented by said fifth signal;
means for establishing a bias signal representative of the derivative of said sixth signal;
means for summing said third signal and said bias signal to establish a seventh signal representative of the desired flow rate of said feedwater; and
means for manipulating the flow rate of said feedwater to said boiler in response to said seventh signal.

4,457,267

KINETIC ENERGY INJECTOR—METHOD AND APPARATUS FOR IMPROVING THE PERFORMANCE AND EFFICIENCY OF A TWO-CYCLE INTERNAL COMBUSTION ENGINE

Eric D. Gorr, Arlington Heights, Ill., assignor to Forward Motion, Inc., Elk Grove, Ill.

Filed Sep. 16, 1983, Ser. No. 533,135
Int. Cl.³ F02M *35/10;* **F02B** *75/18*
U.S. Cl. 123—52 M **5 Claims**



1. An apparatus adapted to be used in the intake system of an internal combustion engine, said apparatus comprising in combination:
flow pickup means for capturing and directing of backflow combustion mixture gasses;
primary passageway means for connection of flow pickup means with uni-directional means;
uni-directional flow means connected to said primary passageway means and to a secondary passageway means to prevent flow of gasses other than from said primary passageway means to said secondary passageway means;
secondary passageway means for connection of said uni-directional flow means with a flow injector means; and
flow injector means for redirection of the captured backflow combustion mixture gasses back into the intake air boot, said apparatus forming a closed loop between said flow pickup means and flow injector means with no openings to or from atmosphere.

4,457,268

VALVE POSITION CONTROL DEVICE

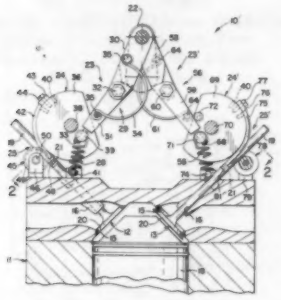
Darrell L. Jones, P.O. Box 1024, Mayfield, Ky. 42066

Filed Jan. 25, 1982, Ser. No. 342,373
Int. Cl.³ F01L *1/26*
U.S. Cl. 123—90.23 **16 Claims**

1. A device to control a valve position in relation to a unidirectionally rotating member, comprising:

valve drive wheel assembly means movable in a reciprocating rotational manner;

flexible arm assembly means in operative association with the unidirectionally rotating member and said valve drive wheel assembly means for driving said valve drive wheel assembly means in rotational reciprocation as the unidirectionally rotating member rotates, wherein said flexible arm assembly means includes a first link operatively connected to the unidirectionally rotating member, a second link operatively connected to said valve drive wheel assembly means, a pivot joining said first link and said second link, and biasing means for urging said first link and said second link into substantially axial juxtaposition; and



flexible rod assembly means carried by said valve drive wheel assembly means for linearly reciprocating the valve.

4,457,269

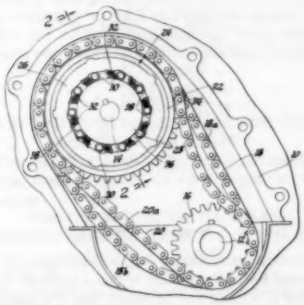
VALVE TIMING DRIVE FOR AN INTERNAL COMBUSTION ENGINE

John M. Beardmore, Howell, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1982, Ser. No. 372,979

Int. Cl.³ F01L *1/02*

U.S. Cl. 123—90.31 **3 Claims**



2. An improvement in valve timing drives for internal combustion engines having a crankshaft, a camshaft and a flexible drive transmitting member drivingly connecting said crankshaft and said camshaft for enforcing conjoint rotation, said flexible drive transmitting member having a normally taut side and a normally slack side and said camshaft being subjected to cyclic torque reversals during normal operation of said engine, said improvement comprising; a one-way drive transmitting member having a first member drivingly connected to said camshaft, a second member axially spaced from said first member and including a sprocket formed on the outer surface thereof, cam surface means formed on the axial face of one of the first or second members, and a drive means disposed between said first and second members adjacent and abutting said cam surface means; and flexible drive transmitting means including a toothed portion drivingly connected between said crankshaft and said sprocket and having a normally taut side opposite said first mentioned taut side, said one-way drive transmitting member being operable to transmit drive through said flexible drive transmitting means to said crankshaft during the cyclic torque reversal whereby both of said taut sides remain taut during normal operation.

4,457,270

HYDRAULIC LIFTER

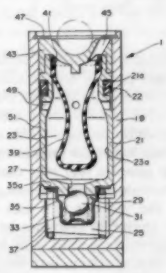
Hisashi Kodama, Nagoya; Katsujiro Sato, Toyota; Tetsuomi Tamura; Tooru Hamamoto, both of Okazaki, and Kazuharu Yamada, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Apr. 11, 1983, Ser. No. 483,705

Claims priority, application Japan, Apr. 12, 1982, 57-53394[U]

Int. Cl.³ F01L *1/24*

U.S. Cl. 123—90.58 **1 Claim**



1. A self-contained hydraulic lifter comprising:

a cylinder member closed at one end;

a hollow, cylindrical plunger member slidably nested in the cylinder member;

said cylinder and plunger members defining a pressure chamber between one end of the plunger member and the closed end of the cylinder member and a reservoir chamber interiorly of the plunger member, said one end of the plunger member having a passage for flow of a hydraulic fluid;

a check valve for said passage openable toward the pressure chamber for allowing a relatively rapid rate of hydraulic fluid flow from the reservoir chamber to the pressure chamber during movement of the plunger member outwardly of the cylinder member;

said plunger member having a side clearance in the cylinder member and a port connecting the side clearance with the reservoir chamber for allowing a relatively slow rate of hydraulic fluid flow from the pressure chamber to the reservoir chamber during movement of the plunger member inwardly of the cylinder member;

an annular sealing member disposed in the side clearance above said port for sealing off the side clearance from the atmosphere;

said reservoir chamber having a portion of a first diameter at the location of the sealing member, and a portion of a second diameter between the location of said sealing member and said one end of the plunger member, said second diameter being larger than said first diameter; and

a flexible, bag-shaped diaphragm in the reservoir chamber

having an open, upper end the exterior surface of which is in liquid-tight pressured contact with an inner wall of the reservoir chamber above the sealing member for sealing hydraulic fluid in the reservoir chamber, one side of said diaphragm inwardly of the reservoir chamber being in surface contact with hydraulic fluid, the other side of said diaphragm contacting the atmosphere.

4,457,271

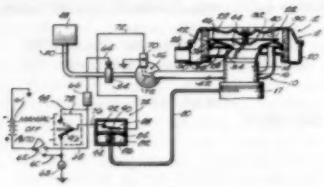
AUTOMATICALLY-CONTROLLED GASEOUS FUEL PRIMING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Ralph H. Fitch, West Allis, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 2, 1982, Ser. No. 404,240

Int. Cl.³ F02N *17/00*

U.S. Cl. 123—187.5 R **11 Claims**



1. An internal combustion engine including an electrical starter for starting said engine, an electrical circuit interconnecting said starter with a source of electrical power, an ignition switch connected in said electrical circuit and selectively movable to a start position to supply electrical power to said starter, a carburetor having an air intake, and supply means for selectivley admitting gaseous fuel into said carburetor air intake, said supply means including a priming system for initiating a small flow of the gaseous fuel into said carburetor air intake to prime said engine in response to movement of said ignition switch to the start position and for terminating said flow of priming fuel in response to said engine commencing to operate after ignition.

4,457,272

FLOW CONTROL DEVICE OF A HELICALLY-SHAPED INTAKE PORT

Ituo Koga, Okazaki, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 12, 1982, Ser. No. 407,629

Claims priority, application Japan, Nov. 4, 1981, 56-163723[U]

Int. Cl.³ F01L *3/06*

U.S. Cl. 123—188 M **14 Claims**

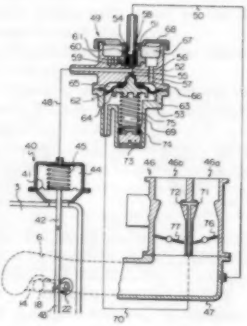
1. A device for controlling the flow in a helically-shaped intake port of an internal combustion engine which has an intake passage connected to said intake port and has a carburetor having a venturi portion, said intake port comprising a helical portion formed around an intake valve, and a substantially straight inlet passage portion tangentially connected to the helical portion and having a helix terminating portion, said device comprising:

a bypass passage branched off from the inlet passage portion and connected to the helix terminating portion of the helical portion;

normally closed valve means arranged in said bypass passage for controlling the flow area of said bypass passage;

a vacuum operated apparatus having a vacuum chamber and connected to said valve means for actuating said valve means in response to a change in the level of vacuum produced in said vacuum chamber; and

control means having a vacuum port which interconnects said vacuum chamber to said intake passage, a check valve which cooperates with said vacuum port and opens said vacuum port when the level of vacuum in said intake passage becomes greater than that of vacuum in said vacuum chamber, an atmosphere port which interconnects said vacuum chamber to atmosphere and has a flow area which is slightly larger than that of said vacuum port, a vacuum cavity connected to the venturi portion of said



carburetor, and an air valve which cooperates with said atmosphere port and is actuated in response to a change in the level of vacuum produced in said vacuum cavity for opening said atmosphere port to open said valve means when the level of vacuum in said venturi portion becomes greater than a predetermined level.

4,457,273

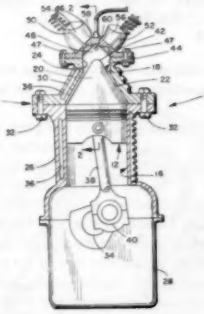
CONICAL PISTON AND CYLINDER HEAD IN INTERNAL COMBUSTION ENGINE

William V. Andrews, 5545 Lemon, Long Beach, Calif. 90805

Filed Apr. 12, 1982, Ser. No. 367,292

Int. Cl.³ F02B *23/00*

U.S. Cl. 123—193 P **2 Claims**



1. In an internal combustion engine employing at least one piston mounted for reciprocation within a cylinder head defining a cylinder at a blind end of which fuel is compressed and ignited, the improvement wherein said piston having its length formed by a skirt section and a top end section extending along a majority of the length of said piston, said top end section facing said blind end of said cylinder and is configured as a complete cone extending upwardly from an outer periphery of said skirt section, and said blind end of said cylinder has downwardly extending therefrom a corresponding conical configuration portion culminating at its apex in an ignition chamber forming said cylinder, the cylinder having a cross sectional area of which everywhere is no greater than that of the conical portion extending from said blind end of said cylinder, and the

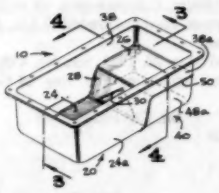
top end section of said piston having a rounded apex which extends into said ignition chamber at top dead center of said engine during its compression stroke, and said piston and said conical portion extending from said blind end of said cylinder are of right circular conical configuration both having a slope of about sixty-four degrees.

4,457,274

OIL PAN ASSEMBLY

Clifford E. Gottlob, Arkansas City, Kans., assignor to Gottlob Engine Conversions, Inc., Arkansas City, Kans.

Filed Oct. 23, 1981, Ser. No. 315,300
Int. Cl.³ F01M *11/06*
U.S. Cl. 123—195 C **9 Claims**



1. An oil pan assembly for an internal combustion engine comprising:

(a) an upwardly open pan having a planar upper edge, peripheral wall means depending therefrom, first and second bottoms extending from said peripheral wall means, said first bottom located relatively far from said edge and said second bottom located relatively close to said edge, and an intermediate wall means extending between and connecting said bottoms,

(b) means defining an auxiliary compartment beneath said second bottom and comprising an auxiliary bottom, underlying said second bottom and spaced therefrom, and auxiliary peripheral wall means extending from said auxiliary bottom to said pan,

(c) weld means joining said auxiliary compartment means to said pan at edges of said auxiliary peripheral wall means and said auxiliary bottom of said auxiliary compartment means, and

(d) constantly open passage means in said intermediate wall means extending between said first and second bottoms of said pan for continuously communicating said auxiliary compartment with said pan independent of temperature.

4,457,275

IDLING SPEED CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Tetsushi Hosokai; Hajime Doinaga, and Hideo Shiraishi, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

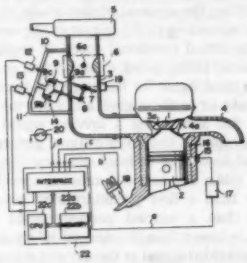
Filed Oct. 8, 1982, Ser. No. 433,436
Claims priority, application Japan, Oct. 9, 1981, 56-161166
Int. Cl.³ F02D *9/02*
U.S. Cl. 123—339 **13 Claims**

1. An idling speed control system for an internal combustion engine having an intake system a throttle valve disposed therein and an exhaust system, comprising

a rotational speed detecting means for detecting the rotational speed of the engine and outputting a rotational speed signal,

an actuator means for driving an adjusting valve for controlling the amount of the intake air to be fed to the engine to control the rotational speed of the engine during idling, and

a control circuit which receives the rotational speed signal and includes a comparing means which compares the actual rotational speed of the engine and a desired idling speed determined according to the operating conditions of the engine and outputs the difference therebetween; an integrating means which integrates the output of the comparing means and outputs the integrated value; and a driving signal generating means which when the actual rotational speed of the engine is not higher than a predetermined value which is higher than the desired idling speed, receives the output of the integrating means and outputs a first driving signal according thereto for controlling the adjusting valve so that the difference between the actual rotational speed and the desired idling speed is nullified, while when the actual rotational speed of the engine becomes higher than the predetermined value, inhibits the input of the output of the integrating means and outputs a second driving signal for positively closing the adjusting valve, said integrating means continuously outputting the integrated value irrespective of whether or not the actual rotational speed is higher than the predetermined value.

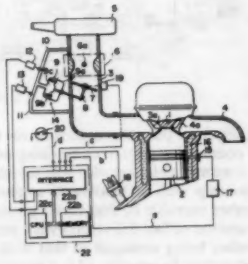


4,457,276

IDLING SPEED CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Tadakazu Ueda, Hiroshima, and Kazumichi Tutumi, Himeji, both of Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Oct. 8, 1982, Ser. No. 433,627
Claims priority, application Japan, Oct. 9, 1981, 56-161167
Int. Cl.³ F02D *9/02*
U.S. Cl. 123—339 **7 Claims**



1. An idling speed control system for an internal combustion engine having an intake system, a throttle valve disposed therein and an exhaust system comprising,

a rotational speed detecting means for generating a rotational speed signal representing the rotational speed of the engine,

an actuator means for controlling an adjusting valve which controls the amount of the intake air to be fed to the

engine to control the rotational speed of the engine during idling, and

a control circuit which receives the rotational speed signal and includes a comparing means for comparing the actual rotational speed detected by the rotational speed detecting means with a desired idling speed determined according to the operating conditions of the engine to output the result of the comparison; a first signal generator for generating a first signal for gradually increasing the amount of the intake air to be fed to the engine as the time lapses; a second signal generator for generating a second signal for controlling the amount of the intake air to be fed to the engine according to the output of the comparing means so that the actual rotational speed of engine is equalized to the desired idling speed; a third signal generator for generating a third signal for feeding a predetermined amount of the intake air to the engine; and a driving signal generating means for generating a driving signal for driving said actuator means, the driving signal generating means being adapted to output at least said first signal as the driving signal when the actual rotational speed of the engine is higher than a first predetermined rotational speed but lower than a second predetermined rotational speed which is lower than the desired idling speed, to output at least said third signal as the driving signal when the actual rotational speed is lower than the first predetermined rotational speed, and to output the second signal as the driving signal when the actual rotational speed is higher than the second predetermined rotational speed.

4,457,277

FUEL INJECTION PUMPING APPARATUS

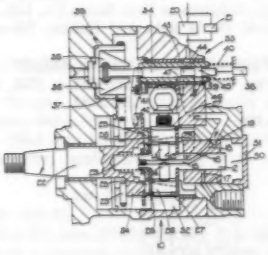
Anthony J. Adey, Gravesend, England, assignor to Lucas Industries plc, Birmingham, England

Continuation-in-part of Ser. No. 368,160, Apr. 14, 1982, abandoned. This application Nov. 14, 1983, Ser. No. 551,507

Claims priority, application United Kingdom, Apr. 23, 1981, 8112552

Int. Cl.³ F04B *49/00, 19/22*

U.S. Cl. 123—387 **4 Claims**



1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine comprising an injection pump including a bore and a plunger movable therein and operable in timed relationship with an associated engine, a fuel quantity control member movable by fuel under pressure in a chamber to vary the amount of fuel delivered by the pump, said quantity control member being arranged so that with increasing pressure in the chamber the quantity of fuel supplied by the apparatus is decreased, a hydraulic feedback servo mechanism for positioning said member, said servo mechanism including valve means comprising first and second axially movable members, port means defined by the members and through which liquid under pressure can flow to said chamber, speed responsive means for adjusting the setting of the first of said members and a linkage extending between the second of said members and the control member, said linkage acting to transmit movement of said control member to the second of said members, whereby for a given change in the setting of said first member the size of said port means will vary to alter the pressure in said chamber and the control member and the second member will move an amount determined by the change in the setting of said first member, characterized in that said first and second members define further port means through which fuel flows to said bore from a source of fuel under pressure, said further port means, in the event that the second member remains fixed due to lack of movement of the control member, being closed by movement of the first member under the action of said speed responsive means as the speed of the engine increases.

4,457,278

FUEL SUPPLY SYSTEM

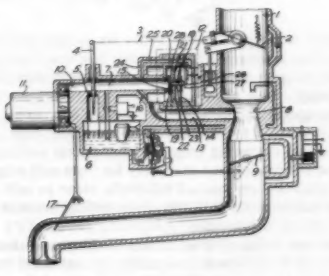
Georg Habel, Brüggen; Rolf-Peter Heidemanns, Neuss, and Hans-Jürgen Müller, Gelsenkirchen, all of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co., KG, Neuss, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,215

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212126

Int. Cl.³ F02M *7/08*

U.S. Cl. 123—438 **6 Claims**



1. A fuel supply system for a mixture-compressing internal compression engine, comprising a main air duct arranged to deliver air to the inlet valves of the engine, a throttle valve located within said main air duct, an air quantity measuring valve located in said main duct upstream from the throttle valve, a carrier air duct connected at one end to said main air duct at a location between said air quantity measuring valve and said throttle valve, a fuel metering nozzle opening into said carrier air duct at a location therein spaced from said main air duct, a proportioning valve positioned in said fuel metering nozzle, means connecting said air quantity measuring valve and said proportioning valve for controlling said proportioning valve, a pump located in said carrier air duct downstream from said fuel metering nozzle, and suction means for conveying fuel from said pump to the inlet valves of the engine, a differential pressure valve connected in said carrier air duct for controlling the flow of carrier air, said differential pressure valve is located in said carrier air duct upstream from said fuel metering nozzle and downstream from said main air duct and said differential pressure valve is adjustable in dependence on operating paramaters, said differential pressure valve having a diaphragm with one side of said diaphragm acted upon by a variable force and the air pressure in said carrier air duct in the region between said fuel metering nozzle and said differential pressure valve, and the other side of said diaphragm acted upon by the air pressure in said carrier air duct upstream from said differential pressure valve, wherein the improvement comprises said differential pressure valve includes a housing containing said diaphragm so that said diaphragm divides the interior of said housing into a first chamber and a second chamber, a partition located within said housing in said first chamber and dividing said first chamber into a first subchamber containing said diaphragm and a second subchamber open to said carrier air duct and separated from said diaphragm by

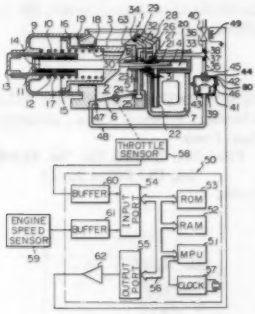
said partition, said housing having a flow opening communicating with said carrier air duct for providing flow of the carrier air from upstream of said differential pressure valve to said carrier air duct downstream of said differential pressure valve, said partition has a nozzle therethrough communicating between said first and second subchambers, and the air pressure of said carrier air duct upstream of said differential pressure valve acts within said second subchamber.

4,457,279

AIR-FUEL RATIO CONTROL DEVICE OF A VARIABLE VENTURI-TYPE CARBURETOR

Mitsuyoshi Teramura; Masatami Takimoto, both of Toyota; Takeru Yasuda, and Mikio Minoura, both of Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisan Industry Co., Ltd., both of, Japan

Filed Aug. 4, 1982, Ser. No. 405,274
Claims priority, application Japan, Feb. 16, 1982, 57-022048
Int. Cl.³ F02B *33/00*
U.S. Cl. 123—439 **10 Claims**



1. An air-fuel ratio control device of a variable venturi-type carburetor for a vehicle engine, the carburetor having an intake passage, a suction piston movable in said intake passage, a float chamber, a fuel passage interconnecting the float chamber to the intake passage, a needle fixed onto the suction piston and extending through the fuel passage, and a throttle valve arranged in the intake passage located downstream of the suction piston, said device comprising:

(a) an air passage having an air inlet and an air outlet which is open to the fuel passage;

(b) means for providing a predetermined air flow rate during engine idle conditions, including

(i) a first air bleed passage having an air inlet and an air outlet connected to the air inlet of said air passage, the air inlet of said first air bleed passage being open to the atmosphere;

(ii) a first jet arranged in said first air bleed passage and defining a restricted opening therein;

(iii) a normally closed first valve means arranged in said first air bleed passage and actuated in response to the operating condition of an engine for opening said first air bleed passage to feed air into the fuel passage from said first air bleed passage via said first jet only when the engine is operating under an idling state;

(c) means for providing a predetermined air flow rate during engine cruising conditions, including

(i) a second air bleed passage having an air inlet and an air outlet connected to the air inlet of said air passage, the air inlet of said second air bleed passage being open to the atmosphere;

(ii) a second jet arranged in said second air bleed passage and defining therein a restricted opening which has a flow area larger than that of the restricted opening of said first jet; and

(iii) normally closed second valve means arranged in said second air bleed passage and actuated in response to the operating condition of the engine for opening said second air bleed passage to feed air into the fuel passage from said second air bleed passage via said second jet only when the cruising operation of the vehicle is carried out.

4,457,280

FUEL INJECTION RAIL ASSEMBLY

Sharon J. Hudson, Jr., Lambertville, Mich., assignor to Sharon Manufacturing Company, Lambertville, Mich.

Filed May 4, 1982, Ser. No. 374,485
Int. Cl.³ F02M *55/02*
U.S. Cl. 123—470 **21 Claims**

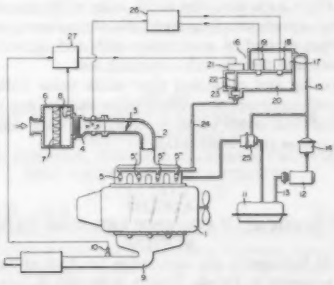
1. A fuel rail assembly for holding a plurality of separate electromechanical fuel injectors in position on an internal combustion engine, said assembly comprising: an elongated hollow fuel rail beam made of two rail members having overlapping sides bonded together to form liquid tight seams extending lengthwise of the beam and a plurality of injector cups mounted in circular apertures in one of said rail members by means of tubular neck sections which protrude through said apertures to the inside of the rail members and have their protruding ends expanded to a diameter larger than the diameter of the apertures, each of said neck sections having an axial length that is less than the radius of the neck opening.

4,457,281

FUEL INJECTION DEVICE FOR A MULTICYLINDER ENGINE

Yoshiji Ueyama, Kobe, and Yoshiaki Asayama, Himeji, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1982, Ser. No. 376,215
Claims priority, application Japan, May 15, 1981, 56-74010
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—482 **2 Claims**



1. A fuel supply device for a multicylinder engine having a plurality of fuel injection valves, said device comprising a vortex flow sensor for producing a frequency output referenced to a vortex speed which is representative of the flow of engine suction air and a fuel metering device including electromagnetic valves which are driven for a predetermined time in synchronism with the frequency output from said vortex flow sensor so as to permit the passage of fuel therethrough, and a control valve for limiting the flow of fuel through said electro-

magnetic valves, the fuel being supplied to said plurality of fuel injection valves in an amount metered by said fuel metering device and thereby injected into said engine; wherein each of said plurality of fuel injection valves is respectively provided for each cylinder.

4,457,282

ELECTRONIC CONTROL FOR FUEL INJECTION

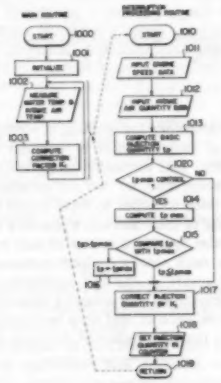
Toshihiko Muramatsu; Akio Kobayashi, both of Kariya; Tomomi Eino, Toyota, and Toshio Kondo, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 22, 1982, Ser. No. 390,963

Claims priority, application Japan, Jun. 24, 1981, 56-97724

Int. Cl.³ F02D *5/02*

U.S. Cl. 123—486 **11 Claims**



1. A method for electronic control of fuel injection of an internal combustion engine for controlling an air-fuel ratio of said engine having at least one fuel injector at a desired air-fuel ratio during a heavy load operation of said engine, said method comprising the steps of:

detecting operating parameters of said engine including at least engine speed and throttle valve opening;

computing by computing means a time width value of an injection pulse applied to said fuel injector;

selecting a maximum time width value of the injection pulse from a preliminarily stored table of maximum time width values thereof in accordance with said detected engine speed and throttle valve opening; and

comparing said computed time width value with said selected maximum time width value and limiting said computed time width value in accordance with said selected maximum time width value.

4,457,283

ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM

Nobuyuki Kobayashi, and Toshimitsu Ito, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

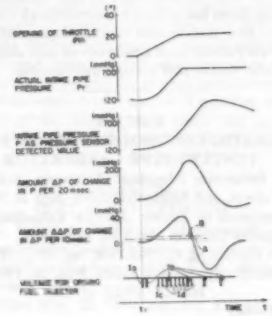
Filed Dec. 22, 1982, Ser. No. 452,095

Claims priority, application Japan, Aug. 30, 1982, 57-149203; Aug. 30, 1982, 57-149204

Int. Cl.³ F02B *3/00, 33/00*

U.S. Cl. 123—492 **10 Claims**

1. An electronically controlled fuel injection system for operating a fuel injector according to electric signals to inject fuel from the fuel injector to an intake system, comprising a means for detecting the secondary differential with respect to time d^2X/dt^2 of a quantity X where X is either intake pipe pressure or intake air flow rate, and a means for carrying out an


OPENING OF THROTTLE
ACTUAL INTAKE PIPE PRESSURE
INTAKE PIPE PRESSURE P AS PRESSURE SENSOR DETECTED VALUE
AMOUNT ΔP OF CHANGE IN P PER 20 msec
AMOUNT ΔΔP OF CHANGE IN ΔP PER 10msec
VOLTAGE FOR DRIVING FUEL INJECTOR
TIME

asynchronous acceleration fuel injection on the basis of said secondary differential d^2X/dt^2.

4,457,284

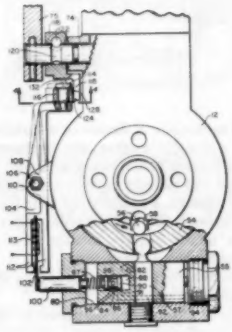
COLD TEMPERATURE ADVANCE MECHANISM

Daniel E. Salzgeber, Windsor, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Jun. 7, 1979, Ser. No. 46,548

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—502 **25 Claims**



1. A fuel injection pump having pumping plungers to deliver measured charges of fuel in sequential pumping strokes and timing means to vary the timing of the pumping strokes relative to the operation of an associated engine, means forming a closed cylinder, a timing control piston in the closed cylinder connected with the timing means for actuating the same, a passageway communicating with the closed cylinder, a servo valve slidably mounted in a bore intersecting said passageway for controlling the entry of fluid into and the dumping of fluid out of said closed cylinder, a servo valve biasing spring, a source of fluid under a pressure correlated with engine speed acting on the servo valve against the bias of the biasing spring, a movable spring seat for the servo valve biasing spring, a thermal responsive element for shifting the movable spring seat to change the force applied by the biasing spring on the servo valve, a heater for actuating said thermal responsive element, an electrical control circuit for energizing the heater, a rotatable throttle shaft and a pivoted lever having one end engaging the movable spring seat and another end engaging a cam fixed to the throttle shaft so that rotation of the throttle shaft to change the quantity of fuel delivered by a pumping stroke mechanically shifts the spring seat to change the biasing force

of the servo valve biasing spring during at least a portion of the load range of the engine to change the timing of the pumping strokes.

4,457,285

SUSTAINED ARC IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

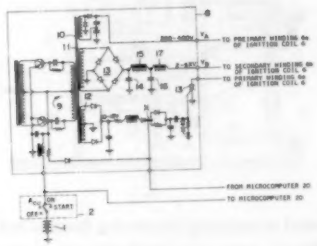
Kyugo Hamai, Yokosuka; Yasuhiko Nakagawa, Kamakura; Meroji Nakai, Yokosuka; Junichi Furukawa, and Takashi Ishizuka, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

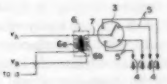
Filed Nov. 19, 1982, Ser. No. 442,906

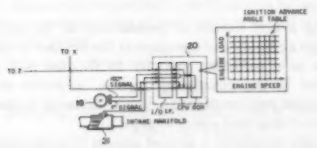
Claims priority, application Japan, Nov. 24, 1981, 56-186842

Int. Cl.³ F02P 3/02, 1/00

U.S. Cl. 123—598 **6 Claims**







1. An internal combustion engine ignition system, comprising:

(a) a DC-DC converting means having a voltage transformer which converts a low DC voltage into a corresponding AC voltage and boosts and rectifies the AC voltage into a first higher DC voltage for generating a spark discharge energy, boosts and rectifies the AC voltage into a second higher DC voltage for generating an arc-sustaining ignition energy, and rectifies the AC voltage into a third higher DC voltage;

(b) an ignition signal generating means which generates and outputs an ignition signal whenever the engine rotates through a predetermined engine rotational angle offset by an angle determined by the engine speed and engine load;

(c) an ignition coil means having a primary winding and secondary winding, one end of the primary winding thereof receiving the first DC voltage from said DC-DC converting means, the other end of the primary winding thereof being grounded when the ignition signal is received from said ignition signal generating means, one end of the secondary winding receiving the second DC voltage from said DC-DC converting means; and

(d) a plurality of spark plugs each located within a corresponding cylinder and having a gap between electrodes thereof and one end thereof being connected to said DC-DC converting means for receiving the second and third DC voltages therefrom when the ignition signal is received by said ignition coil.

4,457,286

ENGINE IGNITION SYSTEM

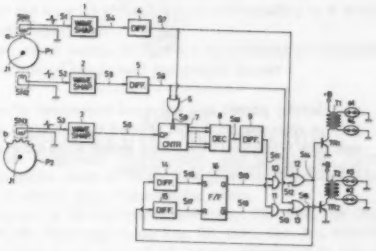
Hiroomi Katayama, Tokyo; Masahiko Fujii, Kanagawa, and Yoshiaki Hirosawa, Saitama, all of Japan, assignors to New Nippon Electric Co., Ltd., Osaka and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jun. 29, 1982, Ser. No. 393,322

Claims priority, application Japan, Jun. 30, 1981, 56-100491

Int. Cl.³ F02P 9/00

U.S. Cl. 123—612 **10 Claims**



1. An engine ignition system, operatively connected between an engine crank and sparkplug ignition coils, comprising:

crank angle sensing means, secured to the engine crank, for sensing the angle of the engine crank and for generating crank angle signals therefrom;

reference position signal generating means, secured to the engine crank, for sensing a reference position of the engine crank and for generating first and second reference position signals therefrom;

signal processing means, operatively connected to said crank angle sensing means and said reference position signal generating means, for generating primary ignition signals, said signal processing means including means for detecting the absence of the first or second reference position signals and for generating replacement ignition signals when either the first or second reference position signals are absent; and

switch means, operatively connected between the sparkplug ignition coils and said signal processing means, for turning the ignition coils on in dependence upon the primary ignition signals or the replacement ignition signals.

4,457,287

ARCHERY BOW ASSEMBLY HAVING UNIVERSALLY MOUNTED HANDLE

Charles E. Babington, 1916 Shire Ct., Dayton, Ohio 45414

Filed Jan. 26, 1982, Ser. No. 343,004

Int. Cl.³ F41B 5/00

U.S. Cl. 124—23 R **25 Claims**

1. In an archery bow assembly of the type including a bow, means forming a bow string extending between opposite end portions of said bow, a hand grip, and means mounting said hand grip on said bow, the improvement wherein said means mounting said hand grip on said bow includes:

connection means providing for universal movement of said hand grip; and

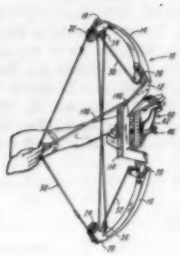
motion restricting means for preventing said universal movement of said hand grip comprising:

first parts fixed in relation to said hand grip and movable with respect to said bow;

second parts fixed in relation to said bow and movable with respect to said hand grip; and

bias means for biasing said first parts and said second parts

into interengagement with each other, said bias means being constructed and arranged to permit said first parts and said second parts to be disengaged from each other



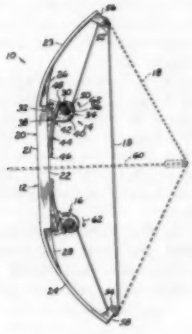
and thereby permit said universal movement of said hand grip in response to forces applied to said hand grip and said bow when said bow string means is drawn in preparation for the shooting of an arrow.

4,457,288

CAM LEVER COMPOUND BOW

Michael R. Ricord, 3217½ S. West St., Stillwater, Okla. 74074

Filed Aug. 24, 1982, Ser. No. 411,067
Int. Cl.³ F41B 5/00
U.S. Cl. 124—23 R **5 Claims**



1. An archery bow comprising:

a handle portion having a front face, a rearward face and opposing end portions and having a pair of limbs projecting from its respective ends;

cam means including a disk-like cam having a cam surface mounted on the handle rearward face at its respective end portions for angular rotation parallel with the longitudinal plane of the handle;

resilient means secured to the rearward face of said handle portion and bearing against each said cam surface for resisting angular rotation of said cam and normally biasing said cam toward an at rest position;

pulley means including a limb pulley secured to the distal end portion of said limbs for connecting a bowstring thereto; and,

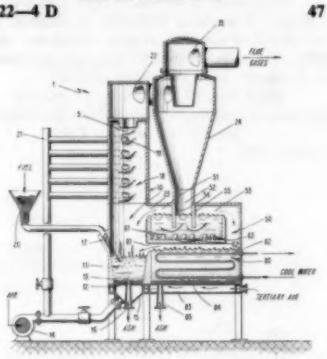
a bowstring entrained over said limb pulleys and connected at its respective ends with said cams in a manner to angularly rotate said cams in response to drawing said bowstring from its at rest position.

4,457,289

FAST FLUIDIZED BED REACTOR AND METHOD OF OPERATING THE REACTOR

Jakob Korenberg, York, Pa., assignor to York-Shipley, Inc., York, Pa.

Filed Apr. 20, 1982, Ser. No. 370,248
Int. Cl.³ F22B 1/00
U.S. Cl. 122—4 D **47 Claims**



1. A method of operating a circulating fluidized bed reactor, comprising:

providing a fluidized bed reactor containing a bed of granular material and having an upper region and a lower region, said upper region having a cylindrically shaped interior surface and a cylindrically shaped exit throat aligned concentrically with said interior surface, said exit throat having a diameter within the range of from about 4/10 to about 7/10 the diameter of said interior surface;

feeding matter to be reacted into said lower region of the reactor;

supplying a first stream of pressurized air to said reactor through a plurality of openings at the bottom of said lower region at a sufficient velocity to fluidize said granular material in the circulating regime, whereby at least a substantial portion of said granular material is continually entrained into said upper region;

tangentially supplying a second stream of pressurized air to said upper region of the reactor through at least one opening in said cylindrical interior surface, wherein, at maximum operating capacity for the reactor, said second stream of air constitutes in excess of about 50% of the total pressurized air fed to the reactor;

maintaining a Swirl number of at least about 0.6 and a Reynolds number of at least about 18,000 in said upper region for inducing in said entrained bed material and any gases present in said upper region a cyclone of turbulence which increases the rate of reaction in the reactor and internally generates at least one reverse flow zone in said upper region for returning said entrained bed material to said lower region of the reactor; and

permitting the gases resulting from the reaction in said reactor to exit from the reactor through said exit throat, while retaining substantially all of said entrained granular material within the reactor.

4,457,290

CHARCOAL COOKER

Gene R. Edwards, 1321 Michigan Ave., Alma, Mich. 48801

Filed Jan. 29, 1979, Ser. No. 6,992
Int. Cl.³ F24C 1/16
U.S. Cl. 126—9 R **4 Claims**

1. A thin profile compact foldable rectangular knockdown charcoal cooker comprising:

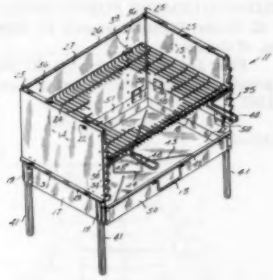
an embossed bottom sharp corner pan frame having vertical

ends, a vertical back and front, and said ends back and front having horizontally disposed flanges, pairs of tubular ferrules secured to said frame adjacent the corners thereof, and a carrying handle pivotally secured to said front of said pan frame;

an embossed bottom sharp corner fire tray nestable in said pan frame and removable therefrom;

a perforated back plate having a top flange and a bottom flange and hinged to the back of said pan frame;

a pair of spaced apart end plates having notched front edges in elevational registry with said perforations in said back plate and having flanged upper and lower edges and



hinged to said pan frame, said upper flanges having an opening therethrough in registering overlap to similar openings in said upper flanges of said back plate;

assembly pins selectively and removably positioned in said registering openings in said flanges;

V-shaped legs resiliently deformable to parallel registry at the ends thereof, and each of said legs selectively and removably positioned in said pairs of ferrules in said frame; and

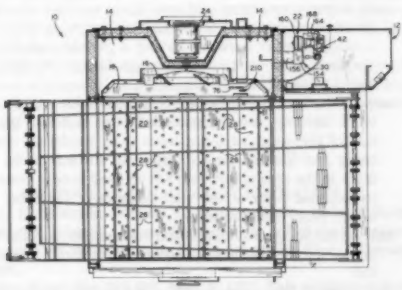
a grill selectively supported in perforations in said back plate and in corresponding of said notches in said front edges of said end plates.

4,457,291

POWER BURNER SYSTEM FOR A FOOD PREPARATION OVEN

Mitchell C. Henke, Fort Wayne, Ind., assignor to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Aug. 11, 1982, Ser. No. 407,267
Int. Cl.³ A21B *1/00*
U.S. Cl. 126—21 A **12 Claims**



1. In a food preparation oven including a chamber means for heating food and impeller means for circulating air in said chamber means, a gas power burner system, comprising:

a gas power burner having nozzle means connected by a gas supply line means to a source of combustible gas to deliver a flow of gas through said nozzle means, and blower means for blowing about said nozzle means a stream of air to form with the flow of gas from said nozzle means a gas-air mixture, whereby, upon combusting the gas-air mixture, a heat source is provided to heat air to be circulated by said impeller means,

modulating valve means connected in said gas supply line means between said nozzle means and the source of gas and being adjustable to vary the flow rate of gas through said nozzle means within a selected range of gas flow rates,

temperature control means having a temperature sensor in the path of the air circulated by said impeller means and being controllably connected to said modulating valve means for adjusting said modulating valve means to maintain the flow of gas at a rate corresponding to a selected temperature, and

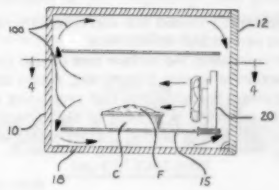
second valve means for selectively initiating or terminating the flow of gas to said gas power burner.

4,457,292

PORTABLE OVEN AIR CIRCULATOR

Jorgen A. Jorgensen, Bloomington, and Donald W. Nygren, Minneapolis, both of Minn., assignors to Northland Aluminum Products, Inc., Minneapolis, Minn.

Continuation of Ser. No. 189,661, Sep. 22, 1980, Pat. No. 4,369,760. This application Sep. 29, 1982, Ser. No. 428,155
The portion of the term of this patent subsequent to Jul. 25, 2000, has been disclaimed.
Int. Cl.³ D24C *15/32*; A21B *1/00*
U.S. Cl. 126—21 A **3 Claims**



1. A compact portable air circulator for use in a cooking oven to increase the rate and uniformity of cooking and baking which comprises:

(a) a fan blade of heat resistant material,

(b) a housing of heat resistant material,

(c) a gear reduction train within the housing connected to the fan blade,

(d) a spring motor within the housing connected to the gear reduction train to drive the fan, and

(e) a large flat horizontal oven rack clamp for positive engagement with a wire oven rack and which clamp also serves as a base for the air circulator so that it might stand upon a horizontal surface in said oven.

4,457,293

VENTILATED GAS RANGE WITH MODULAR COOKING UNITS

Lee J. Berlik, Cleveland, Tenn., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 260,655, May 4, 1981, Pat. No. 4,413,610. This application Apr. 11, 1983, Ser. No. 484,081
Int. Cl.³ F24C *3/00*
U.S. Cl. 126—39 N **5 Claims**

1. In combination:

a compartment;

first and second orifice hoods rigidly secured in said compartment;

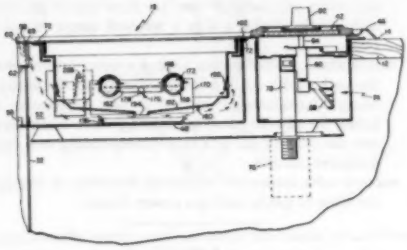
an electrical connector rigidly secured in said compartment;

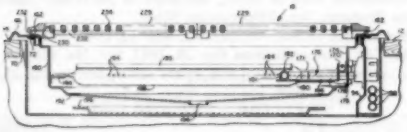
a modular gas grill cartridge removably positioned in said

compartment, said cartridge having first and second burners having the respective mixer heads aligned with said respective first and second orifice hoods and an igniter coupled to said electrical connector;

means for determining the presence of said grill cartridge in said compartment;

first and second means for controlling the supply of gaseous





fuel respectively to said first and second burners through said first and second orifice hoods;

means for ventilating the surface area of said cartridge; and

means responsive to said determining means and said controlling means for activating said ventilating means when said grill cartridge is present in said compartment and either of said first or second control means supplies gaseous fuel.

4,457,294

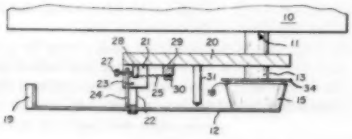
INLET AIR CONTROL FOR STOVE OR FURNACE

Edward H. Cumpston, 6 Stonehedge Dr., Bennington, Vt. 05201

Continuation-in-part of Ser. No. 280,290, Jul. 6, 1981, abandoned. This application May 13, 1982, Ser. No. 377,710

Int. Cl.³ F24C *1/14*; F16K *15/00*

U.S. Cl. 126—77 **16 Claims**



1. A combustion air control for controlling the flow rate of a combustion air stream entering an inlet opening into an air-tight stove or furnace containing a fire, said combustion air control comprising:

a. a control element having a peripheral rim movably arranged to engage a fixed surface around said inlet opening;

b. a pivoted arm supporting said control element for movement toward and away from said fixed surface;

c. a region of said control element within said peipheral rim being concave relative to said fixed surface so that said rim variably constricts the space available for combustion air flowing toward said inlet opening from ambient atmosphere outside said control element;

d. means for biasing said control element away from said fixed surface toward a maximum opening of said variable space between said peripheral rim and said fixed surface;

e. biasing means being non-linear and providing increasing resistance as said peripheral rim approaches said fixed surface; and

f. said control element, biasing means, and fixed surface being arranged so that a variable pressure drop from outside to inside of said variable space constriction urges said control element against said non-linear biasing means to regulate air flow into said inlet opening.

4,457,295

WARMING GARMENT FOR HEATING PEOPLE

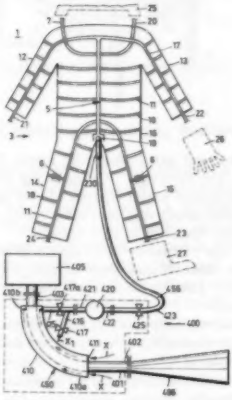
Oskar W. K. Roehr, Windmühlenstieg 15, 2000 Hamburg 52, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 377,941

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121247

Int. Cl.³ A61F *7/00*

U.S. Cl. 126—204 **10 Claims**



1. A warming garment particularly suitable for use by motorcycle operators including an air carrying system constructed with air outlet openings facing the body of a wearer, and consisting of air impermeable material constructed in two layers consisting of an inner layer and an outer layer, said layers being connected with one another in sections to form air carrying ducts, said air carrying system being connected to a hot air feeding hose, said garment comprising:

weld means connecting said two layers together at selected locations thereon to form said air carrying ducts as a continuous duct network having a plurality of air outlet openings, said air outlet openings facing the body and being adjacent in the inner layer;

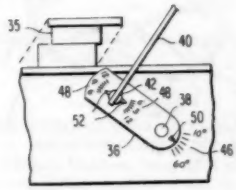
means connecting said hot air feed hose with said duct-network opening into the space between said two layers at one of the outer or inner layer with insulating coatings being provided at the opposite wall surface of the other layer in the area where said hot air feed hose is connected to said one layer at the wall surfaces of the other layer which faces said one layer;

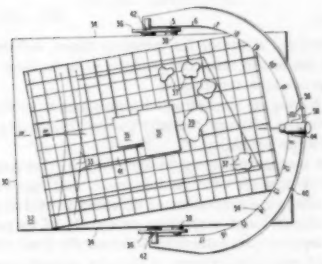
said layers being provided in the connection area and in the hot air inlet area of the hot air feed hose with a reinforcing foil;

said garment being combined with a hot air producing device which consists of a bent or straight pipe line section with connecting devices at both sides and with a heat exchanger of a casing tube which surrounds said pipe line section, said casing tube being provided at one side with a cold air inlet opening and having at its other end a hot air outlet nozzle into which a cold air suction nozzle pro-

vided with a shutoff valve opens, said hot air outlet nozzle being connected to the suction nozzle of a blower whose pressure connection is provided with a control valve and being connected with a flexible hose of said garment.

4,457,296
HEATING MODEL
Paul A. Klann, P.O. Box 2398, Waynesboro, Va. 22980
Filed Apr. 21, 1981, Ser. No. 256,263
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—417 **5 Claims**

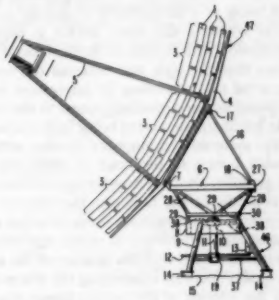




1. An apparatus for studying daylight illumination of a lot supporting objects comprising:
(a) a stationary platform for supporting scaled-down models of said objects;
(b) a pair of arms, each pivotally mounted at one end thereof to opposite sides of said platform for making latitude adjustments;
(c) an arcuate guide track having two ends, each end pivotally mounted to the other end of each one of said arms for making time-of-the-year adjustments; and
(d) a light source means for movably mounting said light source on said guide track, said light source being movable along said guide track for making time-of-the-day adjustments;
(e) a time-of-the-year scale carried by the other end of each arm adjacent the mounting location of the track ends and a latitude scale carried by the platform adjacent the pivotally mounted end of each arm.

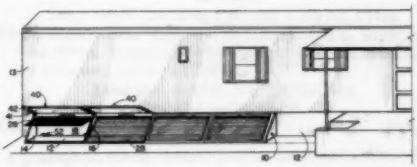
4,457,297
MODULAR SOLAR CONCENTRATOR
Isidore F. Sobczak; William C. Cleveland, Jr., both of Santa Ana, and Robert L. Pons, Mission Viejo, all of Calif., assignors to Ford Aerospace & Communications Corp., Detroit, Mich.
Division of Ser. No. 355,438, Mar. 8, 1982. This application Sep. 6, 1983, Ser. No. 529,196
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—424 **5 Claims**

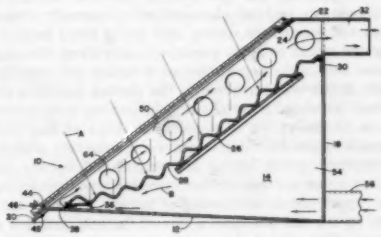
1. A point focusing solar radiation concentrator comprising:
a reflector consisting of several reflective panels each having uniform size and shape, each having a surface area which is a portion of a sphere, and each being substantially equidistant from a small focal aperture;
a solar radiation receiver fixedly positioned at said focal aperture;
wherein the distance between said focal aperture and each panel is substantially equal to one half of the radius of curvature of said panel; and
said panels are individually pointed to reflect solar radiation onto said focal aperture;



wherein the reflector is supported by an azimuth/elevation mount wherein rotation about an azimuthal axis is achieved by means of a rotating turret generally in the shape of an inverted pyramid supporting said reflector;
said concentrator further comprising a base generally in the shape of a pyramid rotatably supporting said turret and rigidly mounted to a mounting surface.

4,457,298
SOLAR HEATING DEVICE
William R. Eubank, Rte. 3, Box 236M, Bartlesville, Okla. 74003
Filed Jun. 4, 1982, Ser. No. 384,886
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—429 **1 Claim**





1. A modular solar heating apparatus comprising a housing, light transmitting cover means supported by the housing for admitting solar energy into the interior thereof, heating plate

means disposed within the housing in spaced substantially parallel planar relation with respect to the cover means, a cold air receiving chamber provided beneath the heating plate means, a hot air chamber provided between the heating plate means and the cover means, said hot air being produced by a greenhouse effect created by the cover means and heating plate means, air passageway means interposed between the cold air chamber and the hot air chamber, cold air intake means provided in the cold air chamber for receiving a supply of cold air therethrough, and warm air discharge means provided in the hot air chamber for releasing the hot air therefrom, the housing being of a substantially triangular cross sectional configuration whereby the cover means is supported at an angular orientation with respect to the horizontal for receiving the sun's rays therethrough, and wherein the cover means is hingedly secured to the housing for movement between open and closed positions for providing access to the interior of the housing, the heating plate means being constructed of a corrugated metallic material and hingedly secured within the housing to provide access to the cold air receiving chamber, a plurality of modules disposed in end-to-end relationship, means providing communication between the interior of adjacent modules, the plurality of modules being installed at the base of a mobile home, and including first means operably connecting the cold air intake means with the interior of the mobile home, and second means operably connecting the warm air discharge means with the interior of the mobile home whereby the air may be circulated to and from the said interior of the mobile home whereby the air may be circulated to and from the said interior of the mobile home and through the modules, and including blower means in communication with the cold air intake means for facilitating movement of air through the apparatus.

4,457,299

INCONTINENCE CONTROL DEVICES

George H. I. Cornwell, 21 Talbot Rd., Harrow Weald, Middlesex, England

Filed May 13, 1981, Ser. No. 263,147

Claims priority, application United Kingdom, Feb. 6, 1981, 8103675

Int. Cl.³ A61B *19/00*

U.S. Cl. 128—1 R **5 Claims**

1. A urethra insertable urinary control device comprising a flexible completely sealed capsule means with an exterior sheath, said capsule means having a non-spherical cross-section to a longitudinal axis with a major sectional axis and a minor sectional axis, said capsule means being internally stressed by at least one prestressed spring, said spring being located in said capsule means to apply pressure axially along the major sectional axis of the capsule means whereby said capsule means with sheath when inserted in the urethra applies a predetermined calculated pressure along the internal wall of the urethra so as to distort the cross-sectional shape of the urethra by capsule means distortion to prevent involuntary urination, said prestressed spring having an integral and unitary extension means at one end thereof, said extension means projecting from the capsule means and having an integral insertion anti-migratory spring and withdrawal device thereon, and said capsule means when subjected to an increase in physical voiding pressure deforming against the action of said spring along one side of its major sectional axis so as to open a free voiding area in the urethra for voluntary urination between the internal wall of the urethra and the external wall of the capsule means.

4,457,300

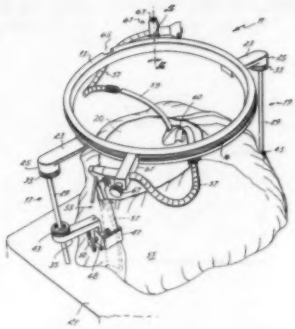
SURGICAL RETRACTOR

Richard B. Budde, Cincinnati, Ohio, assignor to Ohio Medical Instrument Co., Inc., Cincinnati, Ohio

Filed Jun. 7, 1982, Ser. No. 385,483

Int. Cl.³ A61B *17/02*

U.S. Cl. 128—20 **6 Claims**



1. A surgical retractor for retaining tissue, membrane, organs and the like in retracted position in an incision during a surgical procedure, comprising:

a ring having an unobstructed planar upper surface and a continuous, circumferentially outwardly opening channel around its periphery;

support means connected to said ring for holding it in a desired position over said incision, said support means including ring support arms mounted to said ring below said channel and projecting outwardly of its periphery, and support rods extending downwardly from outer ends of said ring support arms so that the support means does not extend above the ring or into its center;

at least one retractor arm holder having a projection slidably captured within said outwardly opening channel of said ring, said arm holder extending outwardly from said ring and not extending over said upper surface or into the center of said ring, said projection being movable within said channel around said periphery of said ring to position said arm holder at a desired location therealong;

at least one retractor arm having a blade attached thereto, said retractor arm being mounted to said arm holder outwardly of said ring so that it can pass below and inwardly of said ring without extending over said upper surface thereof;

said retractor arm holder being movable around said channel past said support means without interference therefrom, to position said blade relative to said incision; and

said retractor presenting a continuous, unobstructed upper surface which provides a rest and guide for stabilizing a surgeon's hand during said surgical procedure.

4,457,301

INTRAMEDULLARY FIXATION DEVICE

Peter S. Walker, Weston, Mass., assignor to Howmedica Inc., New York, N.Y.

Filed Jun. 18, 1982, Ser. No. 389,834

Int. Cl.³ A61F *5/04*; A61B *17/18*

U.S. Cl. 128—92 BC **11 Claims**

1. An intramedullary bone fracture fixation device comprising, a plurality of thin resilient pins substantially longer than the fracture zone to be fixed and a flexible core element hold-

ing the pins apart from one another in a desired spacial arrangement over substantially the full length of the pins, with

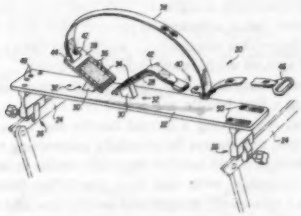
said pins being held in sliding fit in longitudinal grooves in the periphery of said flexible core.

4,457,302

LEG IMMOBILIZING APPARATUS FOR ARTHROSCOPIC SURGERY

Richard B. Caspari, Maidens; Terry L. Whipple, and James A. Thimsen, both of Richmond, all of Va., assignors to Precision Surgical Instruments, Inc., Richmond, Va.

Filed Nov. 5, 1982, Ser. No. 439,439
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—133 **22 Claims**



1. A leg immobilizing apparatus for use in conjunction with an operating table, said operating table having a pair of horizontally extending rail means on opposite sides of said table, said apparatus comprising:

a. bar means extendable entirely across said operating table, said bar means being provided with an electrically insulating coating,

b. depending clamping means on said bar means adapted to be clamped to said horizontally extending rail means,

c. cradling means on said bar means to cradle a leg of a patient,

d. and tourniquet means for stopping the flow of blood in the patient's leg.

4,457,303

RESPIRATING GAS SUPPLY CONTROL METHOD AND APPARATUS THEREFOR

Gerald Durkan, Altoona, Pa., assignor to Tritec Industries, Inc., Wethersfield, Conn.

Filed Nov. 26, 1980, Ser. No. 210,654
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—204.24 **8 Claims**

1. A respirator apparatus comprising:

means for sensing pressure flow in a respiratory system;

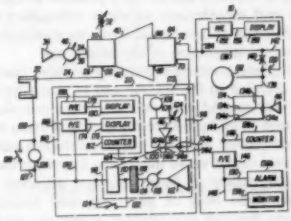
first generating means fluidically connected to said sensing means for generating a first fluid signal, said generating means further comprising at least a first output port and a second output port, said generating means being adapted to discharge said first fluid signal either out said first output port or said second output port;

an apneic event fluid circuit, said circuit comprising:

a variable capacitance device fluidically connected to said first output of said first generating means, said variable capacitance device having a pre-determined maximum capacity for storing a volume of fluid substantially equal to a volume of fluid created by the continuous generation and application of said first fluid signal for a predetermined time;

exhaust means fluidically connected to said variable capacitance device, said exhaust means being adapted to close when said first generating means is generating said first fluid signal at said first output port and to open when said first generating means is not generating said first fluid signal at said first output port; and,

indicator means responsive to the pressure in said variable capacitance device, said indicator means being adapted



for activation when the pressure created in said variable capacitance device by the continuous application of said first fluid signal for a time greater than the pre-determined time period exceeds the maximum capacity of the variable capacitance device; and,

a demand gas controller circuit, said circuit comprising:

source means fluidically connected to said second output port of said first generating means and responsive to said first fluid signal for providing respirating gas to said patient for a time period corresponding to the duration of said first fluid signal; and,

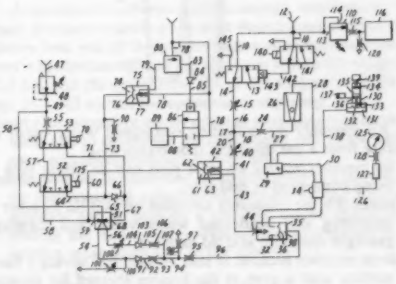
fluid conveying means for conveying said respirating gas from said source means to said patient.

4,457,304

SELF-REGULATING INFANT VENTILATOR

Hugo Molnar, Palm Springs, Calif., and David L. Robbins, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Dec. 4, 1981, Ser. No. 327,553
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—204.25 **3 Claims**



1. An infant ventilator comprising:

a gas delivery system including:

a supply portion comprising a first end adapted to be coupled to a source of gas under pressure, a second end, and a manually adjustable flow control valve between said

first and second ends for regulating the rate of gas flow through said system;

a patient delivery portion having an inlet end coupled to the second end of said supply portion, an opposite outlet end, a mouthpiece between said inlet and outlet ends adapted to be coupled to the breathing passageways of an infant, means for restricting the flow of gas through said patient delivery portion to a rate in the range of about 0 to 25 liters per minute and for generating back-pressure at said second end of said supply portion, outlet valve means at said outlet end movable between a closed position to close the outlet end of said patient delivery portion and cause gas at said mouthpiece under sufficient pressure to cause involuntary inspiration of an infant to which said mouthpiece is coupled, and an open position so that gas will flow past said mouthpiece to allow exhalation of the infant, remove any exhaled gases from the mouthpiece and afford voluntary inhalation of the infant; and

a mouthpiece pressure-regulating portion, comprising a first end coupled to the second end of said supply portion, an opposite second end, venturi means coupled to said second end of said pressure-regulating portion and positioned in said patient delivery portion between said mouthpiece and said outlet valve means for lowering the gas pressure in said patient delivery portion adjacent said venturi means upon flow of gas from said pressure-regulating portion through said venturi means and said outlet valve means, and restriction means between the first and second ends of said mouthpiece pressure-regulating portion having a preset adjustment for regulating the gas flow through said venturi to rates that will cause generally the same pressure at said mouthpiece over said range of gas flow rates through said patient delivery portion; and

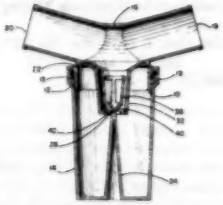
control means for switching said outlet valve means between its open and closed position in a predetermined timed sequence.

4,457,305

WATER TRAP ASSEMBLY

Thomas P. Shanks, Temecula, and Robert P. Price, San Diego, both of Calif., assignors to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Filed Jul. 26, 1982, Ser. No. 401,958
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—205.12 **3 Claims**



1. An assembly for collecting condensed water vapor and moisture from a gas directing tube comprising:

a lid member having an inlet pipe and an outlet pipe for being connected to said tube,

a removable jar releasably mounted on said lid member for collecting said condensed water vapor and forming a gas-tight seal with said lid member,

a drain member secured in said lid member having a funnel portion with a port at the bottom thereof for directing condensed water vapor from said lid member to said jar, and

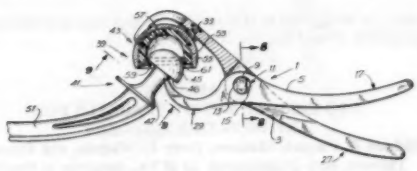
a movable seal member in said funnel portion gravitationally biased to occlude said port and to form a gas-tight seal thereat when said jar is removed from said lid member, wherein said jar further includes means for moving said seal member from sealing engagement with said port when said jar is secured on said lid member.

4,457,306

TOOL AND METHOD FOR ENGAGING TWO MEMBERS OF A JOINT PROSTHESIS

Rocco R. Borzone, Emerson, N.J., assignor to Howmedica, Inc., New York, N.Y.

Filed May 5, 1982, Ser. No. 375,251
Int. Cl.³ A61B *17/00*; A61F *5/04*
U.S. Cl. 128—303 R **3 Claims**



1. A tool for bringing into engagement first and second members of a joint prosthesis, said first member having a substantially spherical head and a laterally-curved neck depending therefrom, and said second member having a cavity formed therein substantially congruent with said head, with said second member being adapted to receive said head through an aperture therein for engagement within said cavity and to hold said head against withdrawal from said cavity,

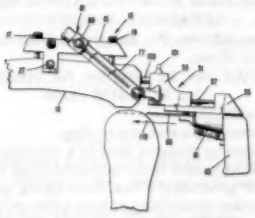
said tool comprising first and second arms, said first arm having a first handle and a first jaw of said tool and said second arm having a second handle and a second jaw of said tool, and means for pivotally connecting said arms so that bringing said handles together results in bringing said jaws together, with said first jaw being bifurcated and curved concavely toward said second jaw and said second jaw being substantially shorter than and curved concavely toward said first jaw, with said second jaw being provided with a curved notch in the tip thereof, said notch being adapted to receive the neck of said first member when said tip bears against said neck, and with a plurality of plastic spacers being provided upon the inner surface of said first jaw for bearing against said second member.

4,457,307

BONE CUTTING DEVICE FOR TOTAL KNEE REPLACEMENT

William T. Stillwell, 96 S Long Beach Rd., Nissequogue, N.Y.

Filed Aug. 20, 1982, Ser. No. 409,920
Int. Cl.³ A61B *17/14*
U.S. Cl. 128—317 **9 Claims**



1. A device for enabling a surgeon to make bone cuts in performing total knee replacement, said device comprising a femoral assembly including an elongated rail adapted to be secured to a femur and substantially parallel thereto, and a support pivotally mounted on said rail for movement about an

axis substantially perpendicular thereto and to the femur, a carriage assembly including a carriage housing and a saw carriage slidably guided for linear movement on said carriage housing, said saw carriage adapted to have a saw fixed thereto, said saw having a blade extending substantially parallel to the direction of said linear movement of said carriage, means interconnecting said femoral assembly and said carriage assembly including adjustment means for securing the carriage assembly to said femoral assembly in several adjusted positions including a plurality of first positions where said saw carriage is slidably guided in substantially parallel paths which are substantially parallel to said elongated rail for making an anterior femur cut, a posterior femur cut, and a proximal tibia cut, a plurality of second positions where said saw carriage is slidably guided in substantially parallel paths which are substantially perpendicular to said elongated rail for making a transverse distal femur cut and for scoring the tibia cortex, and a plurality of third positions where said saw carriage is slidably guided in paths forming an acute angle with said elongated rail for making anterior and posterior femoral chamfer cuts.

4,457,308

PLASTICALLY DEFORMABLE COOLING AGENT

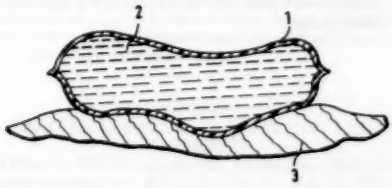
Heinz Golke, Breitscheid; Wolfgang Volker, Tonisvorst, and Andreas Donnerhack, Krefeld, all of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 417,055

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1981, 3148262

Int. Cl.³ A61F *7/00*

U.S. Cl. 128—399 **4 Claims**



1. Plastically deformable cooling agent, consisting of a mixture of liquid nitrogen with at least 8% by weight fine-grained silica gel.

4,457,309

ELECTROCARDIOGRAPHIC ELECTRODE DEVICE

Alf U. Elmeskog, Minkvägen 13, S-754 60 Uppsala, Sweden

PCT No. PCT/SE81/00200, § 371 Date Feb. 19, 1982, § 102(e) Date Feb. 19, 1982, PCT Pub. No. WO82/00089, PCT Pub. Date Jan. 21, 1982

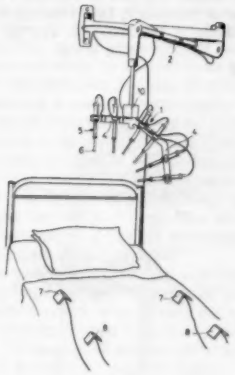
PCT Filed Jun. 30, 1981, Ser. No. 355,582

Claims priority, application Sweden, Jun. 30, 1980, 8004804

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—644 **8 Claims**

1. A support and adjustment device for applying electrocardiographic electrodes to the thorax of a patient comprising: (a) an elongate, substantially bow-shaped electrode holder; (b) support means attached to the electrode holder such that the electrode holder is, adjustable in at least a vertical direction; (c) a plurality of electrodes having resiliently disposed contact portions; (d) attachment means pivotally connecting each of the electrodes to said electrode holder at spaced apart intervals such that each of said electrodes is pivotally adjustable and resiliently displaceable with respect to said electrode holder to enable each of the electrodes to contact a patient's skin at predetermined contact points substantially independent of said patient's thorax configuration; and (e) electrical connecting



means for connecting each of the electrodes with a monitoring device.

4,457,310

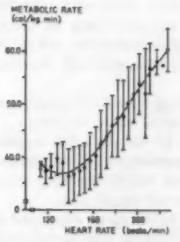
METHOD AND APPARATUS FOR DETERMINING THE ENERGY REQUIREMENTS OF PREMATURE NEWBORNS

Paul R. Swyer, Willowdale; Tibor Heim, and John M. Smith, both of Toronto, all of Canada, assignors to The Hospital for Sick Children, Toronto, Canada

Filed Aug. 11, 1981, Ser. No. 291,878

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—706 **5 Claims**



1. Apparatus for determining the energy requirements of a subject premature newborn from a measurement of the cumulative heat rate of the subject over a predetermined period, wherein the birthweight of the subject is within the range 0.75 to 3.1 kg. and the gestational age of the subject is within the range 26 to 42 weeks, the apparatus comprising:

heart rate averaging means adapted to receive said measurement and to determine the mean heart rate of the subject over said predetermined period; and,

means adapted to apply said mean heart rate to a characteristic mathematical relationship defined by the following equation and to provide a resulting output signal representing the mean energy expenditure appropriate to the applied mean heart rate of the subject:

$$y = -0.0000291x^3 + 0.01685x^2 - 2.93x + 197$$

in which:

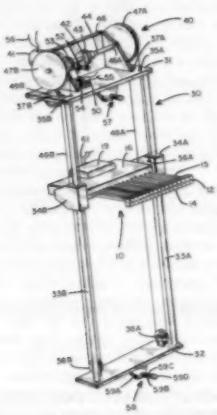
x represents the mean heart rate of the subject in beats per minute and,

y represents the energy expenditure of the subject in calories per kilogram per minute.

4,457,311
ULTRASOUND IMAGING SYSTEM FOR SCANNING THE HUMAN BACK

Paul D. Sorenson, Blaine, and Dale A. Dickson, Fridley, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 3, 1982, Ser. No. 414,705
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **4 Claims**



1. An ultrasound imaging system for scanning the skeletal structure of the human back comprising:

frame means for positioning relative to the back and for defining an axis which crosses over the spine at at least two points;

an array of ultrasound transducers moveably mounted on the frame for movement along the axis in contact with the human back, each ultrasound transducer of the array having means for generating an ultrasound signal, for receiving an ultrasound signal, and for producing an electrical signal representative of the received ultrasound signal;

means for producing a position signal representative of the position of the array along the axis;

means responsive to the electrical signals for providing a range signal representative of the distance from the transducer to objects within the body interacting with the received ultrasound signal; and

means responsive to the range signal and the position signal for producing an output representative of spinal curvature of the human body relative to the axis.

4,457,312
METHOD AND APPARATUS FOR PROVIDING RECORDS OF EVENTS DURING A CARDIAC ARREST

Joseph P. Ornato; Larry Fennigkoh, and Colleen S. Jaeger, both of Omaha, Nebr., assignors to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Continuation-in-part of Ser. No. 132,374, Mar. 21, 1980, abandoned. This application Mar. 29, 1982, Ser. No. 362,905
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—711 **22 Claims**

1. A method of providing records of events during a cardiac arrest comprising the steps of:

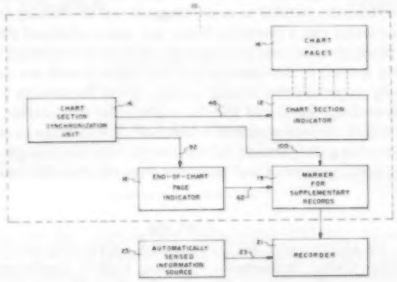
generating timing signals at preset intervals, which intervals have a duration within the range of fifteen seconds and five minutes;

indicating sections of a chart, each having an area of at least 0.5 square centimeters in a time sequence corresponding to the time sequence of said timing signals;

recording observations on said chart at the indicated sections;

automatically sensing electrocardiographic data signals;

recording said automatically sensed electrocardiographic data signals as electrical signals with a predetermined frequency, which electrical signals have at least one characteristic which may change under some circumstances at unpredictable time periods which are greater than the period of said frequency of said signals but are less than the intervals between said timing signals;



the step of generating timing signals including generating timing signals having intervals greater than the time periods between changes in the characteristic of said electrical signals; and

recording said timing signals with said automatically sensed electrocardiographic data signals, whereby the time said data was sensed is indicated and said sensed electrocardiographic data signals may be coordinated in time with said observations.

4,457,313
SHIELD PROTECTOR FOR ARTIFICIAL INSEMINATION AND CULTURE COLLECTION INSTRUMENTS

Richard R. Alter, Delavan, Wis., assignor to Continental Plastics Corporation, Delavan, Wis.

Filed Apr. 23, 1982, Ser. No. 371,208
Int. Cl.³ A61M *37/02*
U.S. Cl. 128—759 **8 Claims**

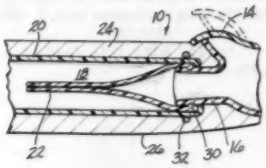
1. A shield protector device for use with an artificial insemination instrument, said instrument including a tubular inner portion positioned within and movable relative to an outer tubular sheath protector portion having a distal end thereon said shield protector device including a cylindrical housing having a closed end, said cylindrical housing being sealingly mounted to said distal end of said outer tubular sheath protector portion and said closed end of said protector device is scored to provide a break-away membrane when said closed end of said shield protector is engaged by the end of the tubular inner portion to permit deposit of the semen into the cervix of an animal.

4,457,314

FEMALE URINE COLLECTION DEVICE AND METHOD

Adrienne Knowles, Middlebury, Conn., assignor to Comfy Catch-A-Spec Company, Middlebury, Conn.

Filed Aug. 2, 1982, Ser. No. 404,143
Int. Cl.³ A61B 5/00; A61F 5/44; A61M 1/00
U.S. Cl. 128—760 8 Claims



1. A urine collection device for use by females which is suitable for collecting urine specimens suitable for laboratory examination comprising:

a compressible housing;

a receiving chamber positioned within said housing, said receiving chamber including an inlet and an outlet, said inlet having means for sealing around the urethral orifice of a female;

a compressible reservoir provided within said housing downstream of said receiving chamber outlet; and

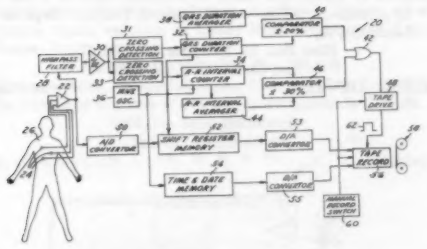
two-way valve means downstream of said receiving chamber outlet and upstream of said reservoir for passing urine from said receiving chamber to said reservoir while selectively prohibiting back flow of urine from said reservoir such that upon compression of said housing and correspondingly said reservoir said two-way valve means passes back through said receiving chamber outlet thereby allowing urine in said reservoir to be passed back through said two-way valve means so as to obtain a urine specimen for laboratory examination.

4,457,315

CARDIAC ARRHYTHMIA DETECTION AND RECORDING

Arvin Bennish, 5615 Wing Lake Rd., Birmingham, Mich. 48010

Continuation-in-part of Ser. No. 943,204, Sep. 18, 1978, abandoned. This application Oct. 22, 1979, Ser. No. 87,590
Int. Cl.³ A61B 5/04
U.S. Cl. 128—704 7 Claims



1. Portable apparatus for detecting and recording arrhythmia in cardiac rhythm signals of ambulatory patients comprising

a battery,

electrode means adapted for placement on a said ambulatory patient for developing electrical signals indicative of said cardiac rhythm signals,

first means powered by said battery and responsive exclusively to portions of said electrical signals normally indicative of ventricular depolarization and independent of other portions of said electrical signals for detecting cardiac arrhythmia,

said first means comprising second means responsive exclusively to time duration of said portions of said electrical signals normally indicative of ventricular depolarization for generating a first control signal and third means responsive exclusively to time intervals between said ventricular depolarization portions of said electrical signals for generating a second control signal,

said first means including said second means and said third means being responsive exclusively to temporal characteristics of said portions of said electrical signals normally indicative of ventricular depolarization and being independent of amplitude of said electrical signals,

fourth means responsive to occurrence of either said first or said second control signal for generating an alarm signal of predetermined time duration,

a magnetic tape cassette recorder powered by said battery and responsive to said alarm signal for recording both said ventricular depolarization portions and said other portions of said electrical signals for a limited time corresponding to said predetermined time duration and bracketing arrhythmia detected by said first means,

such that said recorder is operative to record said signals and drain battery power when arrhythmia are detected and is normally otherwise inoperative, and

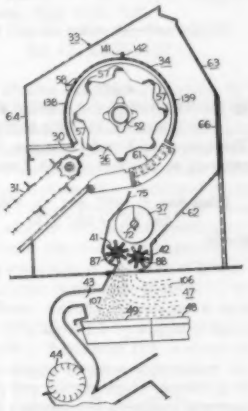
housing means adapted to be portably worn by a said ambulatory patient and enclosing said battery, said first means, said fourth means and said recorder.

4,457,316

AXIAL FLOW COMBINE WITH SINGLE DISTRIBUTION AUGER

Larry R. James, Olathe, Kans., assignor to Allis-Chalmers Corp., Milwaukee, Wis.

Continuation-in-part of Ser. No. 283,975, Jul. 16, 1981, Pat. No. 4,369,617. This application Jan. 24, 1983, Ser. No. 460,580
Int. Cl.³ A01F 7/00, 12/18
U.S. Cl. 130—27 Q 4 Claims



1. In a combine having a header at its front end, a feeder conveyor for conveying harvested crop material from the header upwardly and rearwardly, a processor including a cylindrical foraminous cage and a rotor mounted in said cage in coaxial relation thereto, the combination comprising:

a housing for said processor including front, rear, right and left sidewalls, said cage extending axially between said right and left sidewalls and said rotor being rotatably mounted on said right and left sidewalls on a horizontal transverse axis,

a first radial opening adjacent one axial end of said cage

forming an entrance by which crop material enters said cage from said feeder conveyor,

a second radial opening adjacent the other axial end of said cage forming an exit for crop material from which the grain has been removed by said processor,

a concave in said cage at the first radial opening,

a cleaning section having a first lateral sidewall substantially aligned with the sidewall of said housing adjacent said first radial opening and a second lateral sidewall spaced laterally inward from the housing sidewall at said second radial opening whereby the cleaning section is of less lateral width than said processor housing and the latter has an overhanging part extending laterally beyond said cleaning section,

downwardly sloping portions on said front and rear sidewalls, said sloping portions in said overhanging part of said housing converging downward to an upward facing auger trough and said sloping portion on said rear wall below and rearward of said concave sloping downward and forward to define the rear edge of a laterally extending vertical discharge slot extending substantially across the width of said cleaning section,

a pair of front and rear accelerator rolls extending laterally across the width of said cleaning section, said accelerator rolls being disposed below said slot and above said cleaning section,

said housing including an upright laterally extending wall extending downwardly from beneath said concave to the front of said front accelerator roll and forming at least a part of a front edge of said slot, and

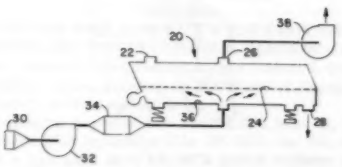
a single distribution auger at the bottom of said housing having opposite ends rotatably supported on said left and right sidewalls on a horizontal transverse axis including a first spiral flight in cooperative relation to said trough and operative upon rotation in a predetermined direction to move threshed material passing through the radial openings of said cage laterally from said overhanging part of said housing to said slot.

4,457,317

METHOD OF REMOVAL OF PAPER WRAPS FROM CIGARETTE FILTER RODS

James M. Thompson, and David L. Denton, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 9, 1982, Ser. No. 406,630
Int. Cl.³ A24C *5/36*
U.S. Cl. 131—96 **12 Claims**



1. The method of removing paper wraps that are secured by thermoplastic adhesive around and/or to waste cigarette filter rods to enable subsequent recovery of the filter material in the cigarette filter rods, the method comprising:

heating the waste cigarette filter rods to the melting point of the thermoplastic adhesive; and

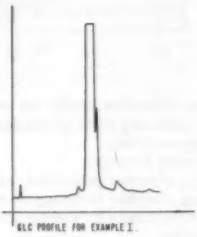
separating the paper wraps from the waste cigarette filter rods.

4,457,318

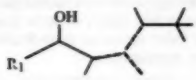
USE IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF SMOKING TOBACCO COMPOSITIONS AND SMOKING TOBACCO ARTICLES OF BRANCHED CHAIN OLEFINIC ALCOHOLS

Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 252,134, Apr. 9, 1981, Pat. No. 4,336,164, which is a continuation-in-part of Ser. No. 212,887, Dec. 4, 1980, Pat. No. 4,318,934. This application Mar. 2, 1982, Ser. No. 354,390
Int. Cl.³ A24B *3/12, 15/30*
U.S. Cl. 131—276 **4 Claims**



1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of intimately admixing with smoking tobacco an aroma or taste augmenting or enhancing quantity of at least one compound defined according to the structure:



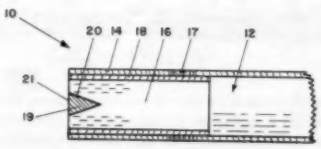
wherein R_1 is selected from the group consisting of methyl and isopropyl and wherein one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represent carbon-carbon single bond.

4,457,319

CIGARETTE FILTER

Charles G. Lamb, and Harry S. Porenski, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jun. 22, 1982, Ser. No. 391,024
Int. Cl.³ A24D *1/04, 3/04*
U.S. Cl. 131—336 **14 Claims**



1. A filter for a cigarette comprising:

a porous filter rod of cylindrical configuration having opposed inlet and outlet ends; and,

generally conically shaped flow directing means with its conically shaped portion inserted into said porous rod at the outlet end of the filter rod for diverging the smoke in the mouth end of the filter and the smoke leaving the mouth end of the filter in a generally angularly outward direction of the filter rod.

4,457,320

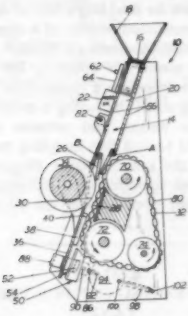
COIN IDENTIFICATION UNIT AND COIN SEPARATOR THEREFOR

Norman Diamond, 60 Greenbriar Dr., Deerfield, Ill. 60015

Filed Oct. 15, 1981, Ser. No. 311,781

Int. Cl.³ G07D 5/08

U.S. Cl. 133—5 R **8 Claims**



1. An apparatus for separating overlapping disks dropping to a receiver comprising:

means including an endless belt having a primary frictional surface for engaging a first disk of the overlapping disks and for imparting a force thereto in a predetermined direction;

means for providing a secondary frictional surface for engaging a second disk of the overlapping disks and for retarding the motion of the second disk in the predetermined direction to separate the disks from each other;

means for driving each of said frictional surfaces; and

means for introducing disks between said primary and secondary frictional surfaces;

said means for providing a secondary frictional surface including a pivotable plate and a roller with said secondary frictional surface thereon, said roller being mounted on said plate, said plate being pivotable so as to increase the spacing between said roller and said primary frictional surface so as to alleviate jamming.

4,457,321

COIN HANDLING APPARATUS

Kenkichi Watanabe; Katsuke Furuya, and Toyoki Kimoto, all of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

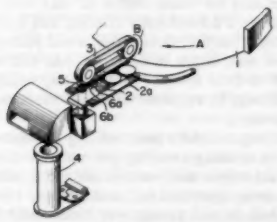
Filed Mar. 26, 1981, Ser. No. 248,028

Claims priority, application Japan, Mar. 28, 1980, 55-39880

The portion of the term of this patent subsequent to Jan. 25, 2000, has been disclaimed.

Int. Cl.³ G07D 9/04

U.S. Cl. 133—8 A **9 Claims**



9. A control apparatus for controlling the passage of coins through a guide passage of a coin handling apparatus, said control apparatus comprising:

blocking means movable between a blocking position preventing passage of coins through said guide passage and a non-blocking position permitting passage of coins through said guide passage, said blocking means including a rotary pin having a notched portion and positioned in one of the side walls of said guide passage such that it rotates at a predetermined angle to open said guide passage, when said notched portion coextends with the inner side of the corresponding side wall of said guide passage, and closes said guide passage when said notched portion protrudes at said predetermined angle into said guide passage;

passage control means for controlling movement of said rotary pin between the blocking and non-blocking positions thereof;

power source detecting means for sensing the nonexistence of power from a power source supplying power to the coin handling apparatus and for generating an output signal upon the sensing of the nonexistence of power; and

a drive circuit responsive to said output signal for driving said passage control means to move said rotary pin into the blocking position thereof.

4,457,322

ALKALINE CLEANING COMPOSITIONS NON-CORROSIVE TOWARD ALUMINUM SURFACES

Fred K. Rubin, Leonia; David V. Blarcom, West Milford, and Daniel J. Fox, Hawthorne, all of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Feb. 11, 1983, Ser. No. 465,710

Int. Cl.³ C23G 1/22

U.S. Cl. 134—2 **18 Claims**

1. An aqueous alkaline cleaning composition for aluminum surfaces which avoids discoloring or tarnishing of the metal surface consisting essentially of a mixture of potassium carbonate and sodium metasilicate in the ratio of about 10:1 to about 1:1, respectively, wherein sodium metasilicate is present in an effective amount up to about 2% by weight of the composition and wherein the pH ranges from about 12.0 to about 13.1.

3. An aqueous alkaline cleaning composition for aluminum surfaces which avoids discoloring or tarnishing of the metal surface consisting essentially of a mixture of lithium carbonate and sodium metasilicate in the ratio of about 1:2 to about 1:3, respectively, wherein sodium metasilicate is present in an effective amount up to about 2% by weight of the composition and wherein the pH is from about 12.0 to about 12.5.

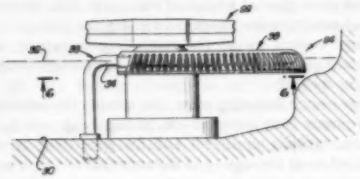
4. An aqueous alkaline cleaning composition for aluminum surfaces which avoids discoloring or tarnishing of the metal surface consisting essentially of a mixture of potassium orthophosphate and sodium metasilicate in the ratio of about 30:1 to about 1:1, respectively, wherein sodium metasilicate is present in an effective amount up to about 1% by weight of the composition and wherein the pH ranges from about 12.0 to about 13.1.

6. An aqueous alkaline cleaning composition for aluminum surfaces which avoids discoloring or tarnishing of the metal surface consisting essentially of a mixture of sodium orthophosphate and sodium metasilicate in the ratio of about 10:1 to about 1:1, respectively, wherein sodium metasilicate is present in an effective amount up to about 2% by weight of the composition and wherein the pH ranges from about 12.5 to about 12.8.

4,457,323
DISHWASHER WITH STEAM GENERATING HEATER AND COLD WATER INPUT

John A. Fay; Cyral M. Walsh, and Venancio Ko, all of Los Angeles County, Calif., assignors to Norris Industries, Los Angeles, Calif.

Continuation of Ser. No. 99,645, Dec. 3, 1979, abandoned, which is a division of Ser. No. 8,951, Feb. 2, 1979, Pat. No. 4,246,916.
This application Apr. 12, 1982, Ser. No. 367,744
Int. Cl.³ B08B 7/04
U.S. Cl. 134—18 2 Claims



1. A method of generating steam within a dishwasher tub having a horizontally disposed electric heater therein, without any substantial heating of the entire body of water, including the steps of:

filling the tub to a preselected static water level such that the electric heater is partially submerged in the water and partially exposed in the air above the water;

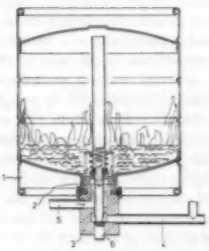
applying heat to the body of water by energizing the partially submerged electric heater to heat a layer of the body of water at the surface thereof, thereby boiling water from such surface layer to generate steam which is immediately released to the air in the tub without moving up through the water; and

terminating the application of heat to the body of water when the temperature at a predetermined location within the tub above the static water level is raised to a predetermined value.

4,457,324
BARREL CLEANING APPARATUS

Manfred Schepper, Herford, Fed. Rep. of Germany, assignor to Leifeld & Lemke Machinenfabrik GmbH & Co. KG, Rahden, Fed. Rep. of Germany

Division of Ser. No. 347,960, Feb. 11, 1982. This application Nov. 4, 1983, Ser. No. 548,880
Int. Cl.³ B08B 9/08
U.S. Cl. 134—102 2 Claims



1. Apparatus for use in the cleaning of barrel-like containers, the containers to be cleaned including a fitting which remains in a first end thereof, the fitting having a riser pipe which projects into the container and further having at least a pair of passages extending therethrough, one of the passages communicating with the interior of the riser pipe, the fitting also including valves which normally close the said passages, said apparatus comprising:

a cleaning head, said cleaning head being connectable to the container fitting, said cleaning head defining a pair of passages which will be in registration with the container fitting passages, said cleaning head further including means for causing the opening of the fitting valves;

first coupling means for coupling a first of said cleaning head passages to a pressurized source of a cleaning liquid, said first coupling means including a control valve;

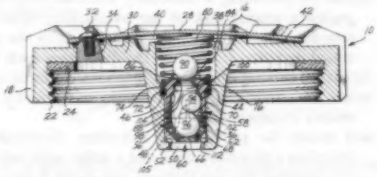
second coupling means for coupling the second of said cleaning head passages to a pressurized gas source, said second coupling means including a control valve; and

pressure regulator means, said pressure regulator means being connected to said first coupling means at the container side of the control valve therein, said pressure regulating means maintaining a difference between the container interior pressure and the pressure of the gas source.

4,457,325
SAFETY AND VENTING CAP FOR VEHICLE FUEL TANKS

Charles J. Green, Vashon, Wash., assignor to GT Development Corporation, Tukwila, Wash.

Filed Mar. 1, 1982, Ser. No. 353,489
The portion of the term of this patent subsequent to Apr. 20, 1999, has been disclaimed.
Int. Cl.³ F16K 17/36
U.S. Cl. 137—39 32 Claims



1. A cap for closing a fuel tank filling and venting tube, said cap being adapted to permit air and fuel vapor flow into or out of the tank but adapted to prevent liquid from escaping in any orientation of the tank from vertical to inverted, said cap comprising:

a cap body;

means associated with the cap body to secure it to the tube for closing;

a cap cover plate secured to the cap body and adapted to extend across a portion of the cap in a direction generally transverse to the axis of the tube;

means in said cap body defining a vent passageway having an inlet end adapted to extend into the tube and having an outlet adapted to extend outwardly of the tube;

a body passage connecting the exterior of the body with the outlet of the vent passageway;

means defining an outlet orifice in said vent passageway bounded by a downwardly directed ball seat;

a light weight buoyant closure ball in said passageway below said ball seat, larger in diameter than said ball seat and adapted to float upwardly into seating engagement with the ball seat in response to liquid movement into said passageway;

flow directing means for gases venting through said passageway, for creating swirling gas currents during venting which act to spin said buoyant ball and dynamically influence it away from said ball seat, and

a heavy ball in said passageway below said light weight buoyant ball, adapted to move by gravity against said light weight ball, and force said light weight buoyant ball onto

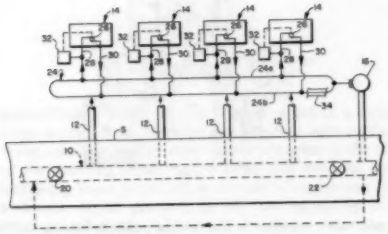
said seat in response to a tilting of the passageway beyond a predetermined amount.

4,457,326

SYSTEM FOR PROVIDING TEMPORARY WATER SERVICE BETWEEN A WATER MAIN AND ONE OR MORE LOCATIONS NORMALLY CONNECTED TO THE MAIN

Frank Donnelly, Rockaway, N.J., assignor to Spiniello Construction Company, Morristown, N.J.

Filed Sep. 11, 1981, Ser. No. 301,430
Int. Cl.³ E03B 7/12; F16L 53/00
U.S. Cl. 137—59 **8 Claims**



1. A system for providing temporary water service between a water main and one or more locations normally connected to said main, said system comprising a pipeline located above ground and having a supply section and a return section, means connecting said pipeline to said main, pipe means for connecting each of said locations between said supply section and said return section into a closed loop and pump means responsive to the water temperature falling below a predetermined value for circulating said water from said supply section, through said location and to said return section, and said pump means generating a sufficient flow velocity to said water in said loop such that the friction developed due to flow velocity prevents the water from freezing.

4,457,327

TEMPERATURE RESPONSIVE VALVE MECHANISM

Kenneth V. Pepper, Elkhart Lake, Wis., assignor to Bemis Manufacturing Company, Sheboygan Falls, Wis.

Filed Jul. 26, 1982, Ser. No. 402,081
Int. Cl.³ F16K 7/12
U.S. Cl. 137—67 **26 Claims**

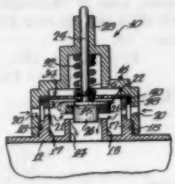
1. A temperature responsive operating mechanism, comprising:

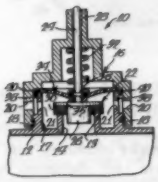
an operating member movable from a first position to a second position; and

temperature responsive operating means for moving said operating member from said first position to said second position responsively to elevation in the temperature of the environment of the operating mechanism;

said operating means comprising biasing means operatively associated with said operating member for urging said operating member from said first position to said second position, and heat deformable means operatively associated with said biasing means and operating member for opposing the biasing action of said biasing means on said operating member, said heat deformable means deforming in response to elevated temperatures below the melting point of the material of the heat deformable means whereby said biasing means gradually moves said operating member from said first position to said second position over a selected period of time;

said heat deformable means comprising a material which is non-elastically deformable when subjected to stresses by the biasing means below the non-elastic yield stress of the





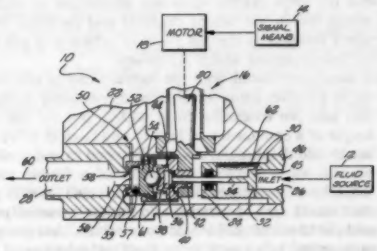
material at elevated temperatures below the melting point of the material.

4,457,328

COMBINED POSITIVE SEAL AND REPETITIVE ACTUATION ISOLATION VALVE

Richard C. Lins, Tarzana, Calif., assignor to HR Textron Inc., Valencia, Calif.

Filed Apr. 26, 1982, Ser. No. 371,401
Int. Cl.³ F16K 13/04
U.S. Cl. 137—68 R **10 Claims**



1. An electromagnetically actuated normally sealed valve for release of high pressure fluid comprising:

means defining a flow path for fluid under pressure;

plug means normally blocking said flow path, said plug means including a unitary member defining a reduced area portion for providing a frangible seal;

an electromagnetic force motor;

an operating rod rigidly permanently secured to said plug means;

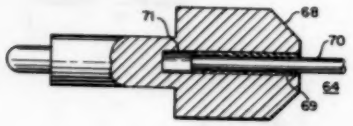
means coupling said operating rod between said plug means and said force motor; and

means for actuating said force motor for applying sufficient force to said plug to rupture said frangible seal and open said flow path.

4,457,329
SAFETY PRESSURE REGULATOR

Barry L. Werley, Allentown; Richard H. Snyder; Joseph E. McQuillen, both of Macungie, and Keith A. Miller, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 4, 1981, Ser. No. 327,323
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—73 **3 Claims**



1. In an apparatus for maintaining constant lower pressure of a gas delivered from a relatively high pressure source of the type including a casing having an internal flexible diaphragm dividing said casing into two major chambers, one chamber being vented to the atmosphere and containing adjustable resilient means for exerting a predetermined constant pressure against the diaphragm, and the other chamber being a gas chamber divided into two sub-chambers, a first inlet sub-chamber for receiving said high pressure gas and a second outlet sub-chamber for accumulating and delivering said gas at a lower pressure to outlet means with valve-controlled means connectable between said first and second sub-chambers to regulate the pressure of said gas in said outlet sub-chamber; a removable valve seat insert ring of an elastomeric material or metal covered elastomeric material whose central opening provides the inlet to the lower pressure gas chamber, a spring-loaded valve assembly co-axial with said insert ring and including a conical valve member movable along the common axis and being constantly urged by its valve spring toward seating engagement about the inner perimeter of said insert ring opening; and means associated with the forward end of said conical valve member and with the central portion of said diaphragm to effect movement of said valve member in accordance with the movement of said diaphragm resulting from an imbalance bet veen the force exerted upon said diaphragm by said resilient means within the vented chamber and the force exerted oppositely thereon by the gas pressure within said gas chamber, the improvement which comprises:

said means associated with the forward end of said conical valve member being an elongated, generally cylindrical pin, said pin extending from within, but not the entire length of a counter-bored hole in said conical valve member to said diaphragm, said pin fastened to and positioned by said valve member by means of a fusible material whereby when heated of a predetermined level is generated inside said apparatus, said fusible material permits said pin to retract inside said counterbore, thus permitting said conical valve member to close said inlet to said lower pressure gas chamber.

4,457,330
REVERSIBLE QUICK EXHAUST VALVE

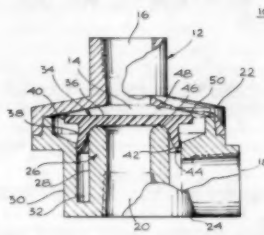
Larry D. Fields, Mira Loma, Calif., assignor to Yardney Corporation, Pawcatuck, Conn.

Filed Feb. 11, 1983, Ser. No. 465,736
Int. Cl.³ G05D *7/00*
U.S. Cl. 137—102 **2 Claims**

1. An improved, reversible, quick exhaust valve, said valve comprising, in combination:

a. a valve housing defining a hollow interior, an entry port, a first exit port, a second exit port and a valve support positioned in said interior to define with said housing a narrow annular passageway between said entry port and said first exit port, said valve support extending from said second exit port toward said entry port; and,

b. a flexible resilient cup-shaped valve member comprising a plate having an annular depending wall spaced inwardly from the outer periphery of said plate, said housing adjacent said plate outer periphery being sloped to facilitate sealing of said entry port during back flow, said entry port and said second exit port being substantially in line with said plate disposed across that line, said valve member being disposed in said interior over said valve support, with said depending wall extending into said passageway,



said valve member in the resting position having said plate block said entry port from said second exit port, said depending wall blocking said entry port from both of said exit ports, said depending wall being sufficiently flexible to permit flow of liquid from said entry port only to said first exit port and, during back flowing through said valve, said valve member being displaced by back flow liquid sufficiently to permit flow of that liquid from said first exit port through said passageway to said second exit port but blocking flow of that liquid to said entry port, said plate during said back flow being forced against the adjacent portion of said housing to seal off said entry port.

4,457,331
PULSE HYDRAULIC MONITOR

Grigory M. Timoshenko, bulvar Pushkina, 27, kv. 33; Vladimir G. Kravets, ulitsa Vareikisa, 36; Vladimir G. Timoshenko, bulvar Pushkina, 27, kv. 33; Petr F. Zima, prospekt Ilicha, 7, kv. 44; Alexandr Z. Astrakhan, bulvar Pushkina, 29, kv. 13; Valentin M. Overko, ulitsa Universitetskaya, 109, kv. 32; Vasily S. Isadchenko, bulvar, Shkolny, 4, kv. 104; Stanislav A. Lenenko, ulitsa, Krasnoflotskaya, 76, kv. 12; Gennady G. Goldynsky, ulitsa, Gertsena, 71-a, kv. 27, all of Donetsk; Karo A. Osmanian, bulvar, Kronshtatsky, 24, korpus 1, kv. 37, Moscow; Evgeny G. Aralov, oblast, Dobropolie, ulitsa Nizovaya, 31, Donetskaya; Georgy V. Maleev, prospekt Teatralny, 24, kv. 4, Donetsk; Igor A. Kuzmich, ulitsa Donskaya, 3, kv. 25; Boris Y. Ekber, ulitsa Zoologicheskaya, 3, kv. 73, both of Moscow, and Nikolai A. Kreschenko, oblast, Novodonetsk, ulitsa Moskovskaya, 6/3, Donetskaya, all of U.S.S.R.

Filed May 24, 1982, Ser. No. 381,302
Int. Cl.³ F01L *25/04*
U.S. Cl. 137—119 **13 Claims**

1. A pulse hydraulic monitor comprising:

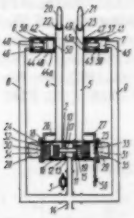
at least two barrels for alternately directing a pulsating jet of hydraulic liquid onto a target;

valve means for dividing the flow of said hydraulic liquid, having an inlet for said hydraulic liquid supplied from a pressure source, and at least two outlets for delivering said hydraulic liquid into the corresponding barrels;

pulse-forming means including a through hollow enclosure member in hydraulical relationship with said barrels, a separating member disposed within said enclosure member and movable between two end positions relative to said barrels so as to assume one of said end positions for forming a pulse at a moment when the pressure of the hydraulic liquid flowing in the corresponding barrel as a

result of changing-over of said valve means assumes a predetermined value, and at least two limit stops for terminating the motion of said separating member at its end position for forming a pulse, each limit stop being functionally associated with the corresponding barrel;

means for retarding the motion of said separating member, arranged in the cavity of said enclosure member of said



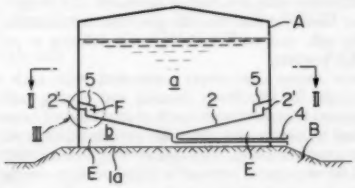
pulse-forming means so that it is subjected to a constant force applied from one side and interacts with said separating member on the other side in response to the action of the constant force applied from said one side and an increasing force produced as a result of an increase in the hydraulic liquid pressure in the corresponding barrel, from the other side.

4,457,332

TANK FOR STORAGE OF A SUSPENSION

Yonesaku Hoshino, Tokyo, and Toshikazu Niwa, Yokohama, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1982, Ser. No. 365,561
Claims priority, application Japan, Jun. 15, 1981, 56-90825
Int. Cl.³ F16K *49/00*
U.S. Cl. 137—334 **3 Claims**



1. A tank for storage of a suspension comprising:

a flatbottomed upright cylindrical outer shell,

an inclined bottom partition wall of conical shape disposed in a bottom portion of said outer shell with its lowest point located substantially at the center of a horizontal cross-section of said cylindrical outer shell,

an upwardly extending side wall provided along the circumference of said inclined bottom partition wall being disposed with a first predetermined interval spaced from an inner surface of said cylindrical outer shell,

a cover including an annular top wall portion inclined substantially in parallel to said inclined bottom partition wall and also including a downwardly extending side wall,

said cover being fixedly secured to an inner surface of said cylindrical outer shell so as to cover said upwardly extending side wall with a second predetermined interval spaced between said downwardly extending side wall and said upwardly extending side wall, said first predetermined interval and said second predetermined interval allowing fluid communication around said inclined bottom partition wall, and

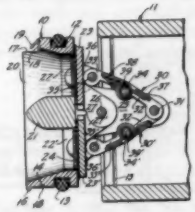
a bent pressure communication chamber extending from an upper side of the inclined bottom partition wall around said upwardly extending side wall to a lower side of the same inclined bottom partition wall.

4,457,333

CHECK VALVE WITH RELIEF-VALVE FEATURE

Donald L. Sharp, Conneaut, Ohio, assignor to Transamerica DeLaval Inc., Princeton, N.J.

Filed May 18, 1981, Ser. No. 264,457
Int. Cl.³ F16K *15/03*
U.S. Cl. 137—454.2 **6 Claims**



1. In a check valve, a generally cylindrically annular valve body having a through-passage between an upstream end and a downstream end, a seat region in substantially a radial plane with respect to the axis of said passage, said body including a seat post extending across said passage at said radial plane and establishing two seat regions on opposite sides of said seat post, separate movable valve members each of which is configurated on its upstream or seat-engageable side for peripherally continuous closing relation with one of said seats in one position, the downstream side of each said valve member having a hinge-arm formation for valve-member articulation about a hinge axis offset both downstream and laterally with respect to the seat-engageable side of said valve member, means including a single body-mounted hinge pin pivotally mounting said valve members on a common hinge axis, said hinge pin extending diametrically of said body and being located downstream from said seat region, first and second knuckles each of which comprises two link arms pivotally connected at their inner ends, the outer end of one link arm of each knuckle being pivotally connected to said body at a location downstream from said hinge pin, the outer end of the other link arm of each knuckle being pivotally connected to the downstream side of one of said valve members at a location that is offset from the valve-member hinge axis, the distance between outer-end pivot connections of said link arms when in valve-closing position being less than the combined pivot-to-pivot distances of said link arms, and spring means reacting between said link arms of the respective knuckles about their inner-end pivot connection and urging said link arms in the direction of their respective valve-closing positional relations, the body connection of said knuckles being on a single axis that is parallel to the hinge axis of the respective valve members.

4,457,334

PRESSURE SENSITIVE VALVE ACTUATOR

Henry Becker, Sterling; Rodney Hubbard, Fredericksburg; Roger Gibbs, Dahlgren, and Roger Engels, Fredericksburg, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

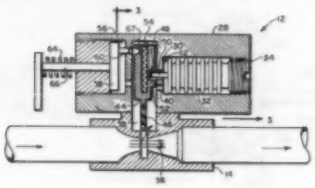
Filed Sep. 24, 1982, Ser. No. 423,335
Int. Cl.³ F16K *17/00*
U.S. Cl. 137—461 **1 Claim**

1. A pressure responsive deivce for shutting off fluid flow through a valve body comprising:

a housing having a first chamber in pressure communication with the flow through the valve body so as to be continously maintained at the same pressure as the flow, and having a second chamber connected to the first chamber by an aperture;

a plunger slidably disposed within the second chamber adapted to move from a first position for allowing flow to pass through the valve body to a second position for blocking the flow from any direction at a predetermined pressure in the valve body;

a pressure sensor having an integral pressure reference means mounted within the first chamber, and having means extending through the aperture adapted to engage said plunger for holding said plunger in the open position, said pressure sensor adapted to respond to increasing pressure within said first chamber and release said plunger at the predetermined pressure to the second position, thereby shutting off the flow through the valve;



said housing having a third chamber communicating with the second chamber through an arcuate slot;

disc means rotatably and linearly slidably mounted within the third chamber and including a part extending into the arcuate slot;

whereby linear sliding of the disc means means engages its extending part with the plunger when in the second position and rotation of the disc means then resets the plunger to the first position where it is held by the pressure sensor extending means.

4,457,335

PENILE ERECTILE SYSTEM

Robert E. Trick, Racine, Wis., assignor to Medical Engineering Corporation, Racine, Wis.

Division of Ser. No. 305,048, Sep. 24, 1981, Pat. No. 4,369,771.
This application Sep. 29, 1982, Ser. No. 426,566
Int. Cl.³ A61F *5/00*; F16K *17/04*
U.S. Cl. 137—522 **1 Claim**

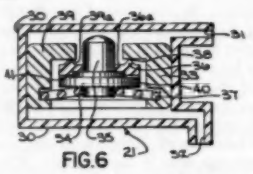


FIG.6

1. A pressure control valve for an implanted hydraulic system comprising:

(a) a valve jacket having an outer wall which is uninterrupted except for an inlet near the top of the jacket and an outlet near the bottom, said outer wall at the top being manually deflectable downwardly;

(b) a valve housing positioned in and substantially filling said jacket so that fluid entering the inlet cannot exit via the outlet without passing through said housing, said housing having an open top and an open bottom, and a passage extending from the top to the bottom, said passage being partially closed at the top by an inwardly directed shoulder;

(c) a poppet having a top and a bottom mounted in the passage in said housing;

(d) an annular seal member positioned on the top of said poppet, said member having a sharp sealing edge for engaging the underside of the inwardly directed shoulder of the valve housing and a pair of vents at the bottom which assist in providing a good sealing engagement; and

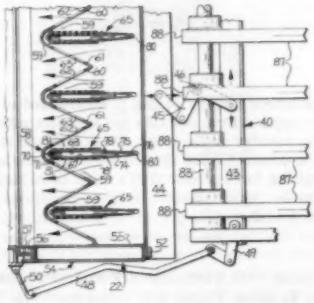
(e) a precalibrated spring exerting a force upon the bottom of said poppet and urging the poppet upwards so that the sealing edge is normally in sealing contact with the underside of the shoulder thus closing the passage in the housing of the valve, said valve automatically opening when the pressure sensed on the top of the poppet exceeds the upward force exerted by the precalibrated spring and being manually openable when the top of said valve jacket is deflected downwardly so that the poppet is moved to break the seal between the sealing edge and the underside of the shoulder of the housing.

4,457,336

AIR FLOW CONTROL APPARATUS

Thomas T. Allan, Washington; Cecil W. Bowers, Chocowinity, and Joseph A. Wood, Greenville, all of N.C., assignors to Flanders Filters, Inc., Washington, N.C.

Filed Jul. 14, 1982, Ser. No. 398,404
Int. Cl.³ F16K *1/20*; F24F *13/10*
U.S. Cl. 137—601 **14 Claims**



1. An air flow control apparatus for regulating the volume of air flow in a ventilating system or the like, and comprising:

a duct defining an air passageway therethrough, orifice frame work means extending transversely across said duct and including a plurality of troughs of V-shaped cross section disposed in a side-by-side, parallel arrangement, with each trough including side walls and a bight portion and having at least one elongate opening extending therethrough, and with each opening defining a peripheral edge portion,

closure means operatively associated with each of said troughs for selectively opening and closing each of the openings therethrough, each of said closure means being sized to overlie and cover the peripheral edge portion of each such opening, with said closure means being mounted for movement between a closed position overlying and covering each opening and an open position withdrawn therefrom, and such that the opposed portions of said closure means and peripheral edge portion of each opening are relatively movable in a generally perpendicular direction toward and away from each other, and with one said closure means and peripheral edge portion including resilient means positioned to surround the opening and be compressed to effect sealing of the opening when the closure means is in its closed position, and

control means for effecting selective movement of each of said closure means between said open and closed positions, to permit full opening or full closure or the apparatus as well as modulation of the air flow rate.

4,457,337

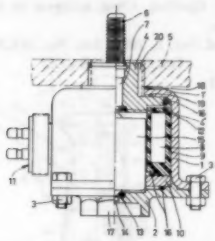
DRAIN VALVE, PREFERABLY FOR A VEHICLE BRAKE SYSTEM

Sten E. Ö. Andersson, Landkronaä, and Nils A. Nelander, Vintrie, both of Sweden, assignors to SAB Automotive AB, Landskrona, Sweden

Filed Mar. 23, 1982, Ser. No. 361,057
Claims priority, application Sweden, Mar. 27, 1981, 8101975
Int. Cl.³ F16K *24/00*
U.S. Cl. 137—614.13 **1 Claim**

1. In a drain valve screwed into the bottom of a tank for draining condensate from said tank with means connected to

electrical terminals for electrically heating the valve to avoid freezing of the condensate from a normally energized solenoid operating to hold a valve seat into sealing engagement in an upper seat extending into the tank through a threaded bore thereby preventing escape of contents from the tank and operating upon deenergization to move the valve to a lower seat coupled for draining condensate, the improvement comprising, a rotatable housing comprising a neck defining said upper seat with threads mating into said bore and a housing member carrying said electrical terminals and solenoid relatively rotatable on said neck, a draining channel axially extending through the mating threads from the atmosphere into the tank and sealing means closing and opening said channel in response to



rotation of the housing member on said neck in opposite directions, whereby the housing and its electrical terminals may be aligned and the tank may be emptied through said channel by rotation of said housing member on said neck a partial turn.

4,457,338

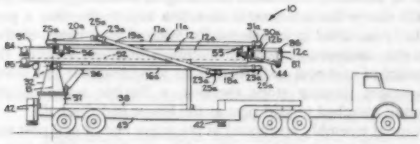
TELESCOPING BOOM SUPPORTED FLIP-FLOP SERVICE LINE

Thomas A. Moller, Brea, and Houston W. Knight, Whittier, both of Calif., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 244,529, Mar. 16, 1981, abandoned. This application Feb. 24, 1983, Ser. No. 469,359

Int. Cl.³ F16L *27/00*

U.S. Cl. 137—615 **5 Claims**



1. A boom-supported articulated pipeline for use with a telescoping boom assembly having a plurality of boom sections, said pipeline having a reduced number of pipe lengths to decrease cost and weight while retaining the required length, said pipeline comprising:

an inboard pipe mounted on said boom assembly generally parallel to an inboard boom section and attached to said inboard boom section;

an outboard pipe mounted on said boom assembly generally parallel to said boom assembly and movable along the full length of said boom assembly;

first, second and third intermediate pipe sections connected end-to-end through a pair of swivel joints;

means for pivotally connecting said intermediate pipe sections between an outer end of said inboard pipe and an inner end of said outboard pipe through respective swivel joints at said outer and inner ends; and

means for flip-flopping each of said intermediate pipe sections to reverse their direction of alignment so that one end of each of said intermediate pipe sections extends in a direction inwardly from said outer end of said inboard pipe when said pipeline is in a retracted position, and said one end of each of said intermediate pipe sections extends in a direction outwardly from said outer end from said inboard pipe when said pipeline is in an extended position and,

one end of each of said inboard pipe and said outboard pipe extend outwardly from the inner end of said inboard pipe and in the same direction as each said one end of each said intermediate pipe sections when said pipeline is in extended position, and,

said one end of each of said inboard and outboard pipes also extend in the same said outward direction when said pipeline is in retracted position, while each said one end of said intermediate pipes extend inwardly in said retracted position.

4,457,339

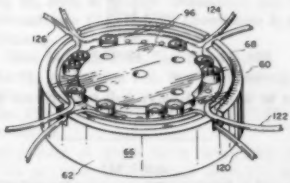
MULTIPROGRAMMABLE PINCH VALVE MODULE

Juan J. S. Juan, Madrid, and Vicente M. Valentin, Majadahonda, both of Spain, assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Mar. 3, 1982, Ser. No. 354,171

Int. Cl.³ F16K *31/524*

U.S. Cl. 137—624.16 **10 Claims**



1. A pinch valve module comprising means for defining plural paths for plural flexible conduits, multiple cam and follower means operable selectively upon ones of said flexible conduits alternatively to compress and to release same, means defining an annular path for said cam means proximate to said flexible conduits and said follower means mounted at selected locations along the annular path of said cam means and drivable thereby against portions of said flexible conduits to compress same during passage of said cam means along said annular path and means for driving said cam means, and pins are disposed along said path, selected ones of said pins mounting said followers means being located at the same radial distance from the center of said annular path.

4,457,340

POWER-ASSISTED VALVE, PARTICULARLY FOR SYSTEMS HANDLING VISCOUS MATERIALS

Wallace F. Krueger, 4401 Merriweather Rd., Toledo, Ohio 43623

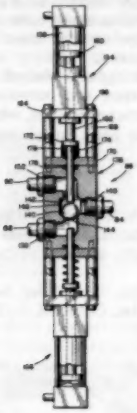
Division of Ser. No. 103,382, Dec. 13, 1979, Pat. No. 4,339,233. This application Apr. 5, 1982, Ser. No. 365,339

Int. Cl.³ F16K *31/122, 15/04*

U.S. Cl. 137—625.5 **4 Claims**

1. A fluid-assisted ball valve comprising means forming a first valve seat, means forming a second valve seat, means forming a retaining chamber between said valve seats, a valve ball in said retaining chamber, an inlet passage communicating with said retaining chamber, a first outlet passage communicating with said retaining chamber through said first valve seat, a second outlet passage communicating with said retaining chamber through said second valve seat, first fluid-operated means forming a first cylinder, a first piston reciprocable in said first cylinder, first rod means connected to said first piston and extending out of said cylinder toward said valve ball, said first rod means being separate from said valve ball, and line means for supplying fluid under pressure to an end of said first cylinder to cause said first rod means to urge said valve ball toward said first valve seat, second fluid-operated means forming a second cylinder, a second piston reciprocable in said second cylinder, second rod means connected to said second piston and extending out of said second cylinder toward said

valve ball, and second line means for supplying fluid under pressure to an end of said second cylinder to cause said second



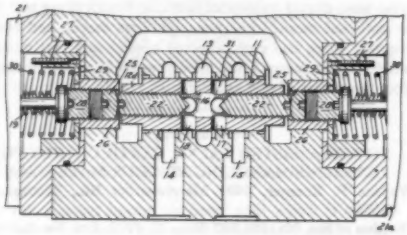
rod means to urge said valve ball toward said second valve seat.

4,457,341

VARIABLE PRESSURE DROP PROPORTIONAL MOTOR CONTROLLED HYDRAULIC DIRECTIONAL VALVE

Ronald A. Aspinwall, Detroit, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed Mar. 4, 1982, Ser. No. 354,742
Int. Cl.³ F15B *13/044*
U.S. Cl. 137—625.48 **11 Claims**



1. A variable pressure drop proportional motor controlled hydraulic directional valve comprising

a valve body,

a cylindrical bore in said body,

a cylindrical spool slideable in said bore,

a force motor operatively connected to one end of said spool for moving said spool,

said force motor comprising a servo solenoid having a plunger engaging the spool wherein the stroke of the plunger is proportional to the input current to the solenoid so that the position of the plunger relative to the body is determined by the magnitude of the input current,

said body having a pressure inlet port extending to said bore,

said body having spaced annular outlet ports extending to said bore on opposite sides of said pressure inlet port,

said spool having an axial passage and at least two longitudinally spaced sets of generally radial passages such that when the spool is moved, one of said sets of said radial passages will provide communication from the pressure inlet port through said axial passage and the other set of radial passages to one of said outlet ports,

and a member adjustably positioned axially in said spool for varying the area of flow to the other set of said radial passages so that the pressure drop between the axial passage and radial passages can be adjustably varied,

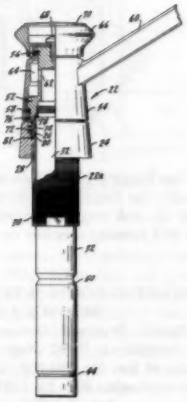
said member having a conical end extending axially into said axial passage adjacent said other set of radial passages to define a variable area of flow from said axial passage to said other set of radial passages.

4,457,342

HIGH RISE KITCHEN SPOUT

Alfred M. Moen, Grafton, Ohio, assignor to Stanadyne, Inc., Windsor, Conn.

Filed Jun. 1, 1982, Ser. No. 383,569
Int. Cl.³ E03C *1/02*
U.S. Cl. 137—801 **1 Claim**



1. A vertically adjustable faucet spout including a base and guide sleeve for attachment to a sink top or the like, a post slidably mounted in said sleeve for vertical movement relative thereto, elastomeric bumper members positioned about the exterior of said post and effective to provide upper and lower movement limiting stops therefor, a flexible water supply conduit attached to said post at the lower end thereof,

a spout assembly positioned at the upper end of said post and seated upon said base when the post is in a full lowered position, said spout assembly including a spout body attached to the upper end of said post and seated upon said base when said post is in a fully lowered position, a housing mounted upon said spout body, a sealed chamber formed within said housing and exteriorly of said spout body, passage means in said spout body in communication with said chamber, a spout integral with said housing and in communication with said chamber, said upper elastomeric bumper member being seated upon the top of said base when said post, body, housing and spout assembly are in the fully lowered position, with said lower bumper member being in contact with the lower end of said sleeve when said assembly is in the uppermost position,

the exterior of said post having recess means thereon, an interior groove in said body, a retaining spring positioned in said groove to cooperate with said recess means to position said post in a vertically raised position relative to said base, a wiper seal positioned within said base and bearing against the exterior of said post, said wiper seal being positioned adjacent said retaining spring, said post being pressure balanced whereby back pressure therein caused by flow control devices will not cause vertical movement thereof.

4,457,343

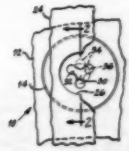
FLOW WASHER

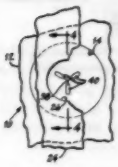
Keith E. Zakausky, Hanover, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 20, 1982, Ser. No. 419,891

Int. Cl.³ F15D *1/02*

U.S. Cl. 138—45 **10 Claims**





1. A flow control comprising:

(a) conduit means defining a fluid passage having an inlet and outlet, and including structure defining a cavity having an annular support surface diposed about the outlet;

(b) a resilient flow washer formed of elastomeric material received in said cavity in closely fitting relationship thereto; said flow washer having,

(i) opposite faces with one face thereof disposed toward said outlet and initially spaced from said support surface,

(ii) an aperture formed therethrough between the opposite faces thereof, said aperture configured to have a plurality of inward projections disposed about the periphery thereof in generally equally spaced arrangement, said projections configured to define therebetween at inlet pressures below a threshold level a plurality of radially outer cavities each communicating with said central aperture through a restricted throat region such that upon said washer opposite face experiencing inlet fluid pressure at or below the threshold level, said washer is substantially undeformed and said central aperture is maintained, and upon said opposite face experiencing increasing inlet fluid pressures reaching said threshold level the washer is deformed such that said one face contacts said support surface and upon further increased fluid pressure said projections come together at the ends thereof in mutual contact to close said central aperture and form each of said outer cavities into an aperture to create a plurality of flow apertures disposed circumferentially about said washer.

4,457,344

REED FOR A WEAVING MACHINE

Kurt Marti, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

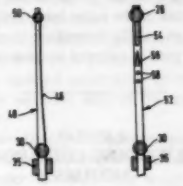
Filed Nov. 13, 1981, Ser. No. 321,198

Claims priority, application Switzerland, Nov. 20, 1980, 8580/80

Int. Cl.³ D03D *49/62*

U.S. Cl. 139—192 **12 Claims**

1. A reed for a weaving machine having a plurality of parallel spaced apart dents, at least some of said dents being of less dense material at an upper end than at an opposite end to have



a specific weight which decreases in a direction from the bottom to the top of said reed.

4,457,345

BLENDED YARN CONTAINING ACTIVE CARBON STAPLE FIBERS, AND FABRIC WOVEN THEREFROM

Hubert von Blücher, Freytagstrasse 45; Hasso von Blücher, Sohnstrasse 58, both of D-4000 Düsseldorf, and Ernest de Ruiter, Höhenstrasse 57A, D-5090 Leverkusen 3, all of Fed. Rep. of Germany

Filed Nov. 15, 1982, Ser. No. 441,693

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145267

Int. Cl.³ D03D *15/00*; D02G *3/04, 3/44*

U.S. Cl. 139—420 R **13 Claims**

1. A blended yarn of staple fibers comprising by weight about 5 to 75% of active carbon staple fibers and about 95 to 25% of textile staple fibers, the active carbon fibers having a surface area of 350 to 1100 m^2/g and having been produced by cutting a tow of active carbon monofilaments.

8. A blended yarn according to claim 1 in the form of at least one of the warp and filling of a woven fabric.

4,457,346

WEFT INSERTING NOZZLE OF AN AIR-JET TYPE WEAVING LOOM

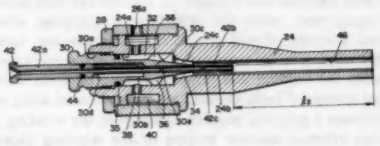
Mamoru Nagashima, Nagoya, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 21, 1982, Ser. No. 390,551

Claims priority, application Japan, Jul. 2, 1981, 56-102252

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 **9 Claims**



1. A weft inserting nozzle of an air jet type weaving loom, comprising:

an outer body having therein an axially extending through hole with a frusto-conical section thereof;

an inner body coaxially disposed in the outer body hole and axially movable relative to the same, the inner body having at its one end a frusto-conical portion which is received in and spaced from the frusto-conical hole section of the outer body to define therebetween a frusto-conical space from which pressurized air is adapted to be ejected toward the exit of the outer body hole, the inner body having therein an axially extending through hole reaching the apex of the frusto-conical portion of the inner body; and

a weft guiding body coaxially disposed in the inner body hole and axially movable relative to the same, the weft

guiding body having an extension which projects from the apex of the frusto-conical portion of the inner body and terminates at a position between the apex of the inner body and the exit of the outer body hole, the weft guiding body having an axially extending through hole through which a weft yarn is adapted to pass.

4,457,347

DEVICE FOR WINDING COILS FOR ELECTRIC MOTORS

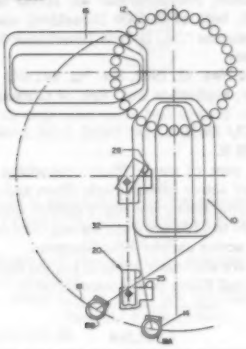
Wolfgang Roth, Nidderau; Karl-Heinz Fichtner, Hanau am Main, and Dieter Feßler, Bad Homburg, all of Fed. Rep. of Germany, assignors to Statomat-Globe Maschinenfabrik GmbH, Niederdorfelden, Fed. Rep. of Germany

Filed Jun. 25, 1981, Ser. No. 277,340

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024219

Int. Cl.³ B21F *3/00*

U.S. Cl. 140—92.1 **11 Claims**



1. In a device for winding coils or groups of coils for electric motors, comprising a winding template, a winding nozzle located adjacent said template and movable in a winding path circularly relative thereto for winding a wire moved through said nozzle onto said winding template, a receiver located below said template and comprising parallel-axis slits movable into engagement with the template, a gripping element mounted laterally of said template and axially and radially movable relative to the template, said gripping element including means for holding and gripping a wire between coils or between groups of coils, the said gripping element being movable between a gripping position adjacent to the winding nozzle when relative circular motion of the winding means is stopped and at least one winding position assumed in a beginning phase of a winding process, said winding position being adjacent to the template: the improvement wherein said gripping element is movable only in a plane that is essentially parallel to the longitudinal axis of said template, said gripping element being movable in said plane between a winding-on position adjacent said template and a gripping position, and wherein said device comprises means operatively connected to said winding nozzle for stopping said winding nozzle in a plurality of defined stopping positions in its winding path, said gripping position of said gripping element being common to said plurality of defined stopping positions whereby, when said winding nozzle is positioned in any of said plurality of predetermined stopping positions, said gripping element, when moved into said gripping position, is positioned to engage a wire extending between said winding nozzle and said winding template.

4,457,348

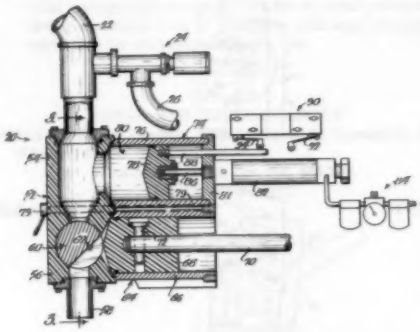
FOOD PRODUCT FILL PUMP

Martin J. Mueller, 4520 Wonder Lake Dr., and Martin Mueller, 4949 E. Lake Shore Dr., both of Wonder Lake, Ill. 60097

Filed Jul. 7, 1982, Ser. No. 396,068

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—1 **22 Claims**



1. An apparatus for sequentially filling a plurality of containers each with a quantity of flowable product, comprising:

housing means having product inlet means adapted to receive a supply of food product from an associated source, and product outlet means adapted to deliver said product to each said container;

cyclical pump means associated with said housing means adapted to alternately communicate with said product inlet means and said product outlet means for cyclically receiving said quantity of product from said inlet means and thereafter forcing the product through said outlet means;

product accumulator means, including an expansible chamber adapted to receive food product, communicating with said product inlet means for maintaining the pressure of food product within the inlet means generally constant; and

control means operatively associated with said product accumulator means for increasing and decreasing the speed of the sequential filling of said containers responsively to the volume of food product in said expansible chamber.

18. The apparatus in accordance **13**, wherein

said accumulator means is joined to said housing immediately upstream of said rotary valve means.

4,457,349

VOLATILE HYDROCARBON RECOVERY SYSTEM FOR TANK TRUCK UNLOADING HEADERS

Gholam R. Vazin, Westminster, Calif., assignor to Chevron Research Company, San Francisco, Calif.

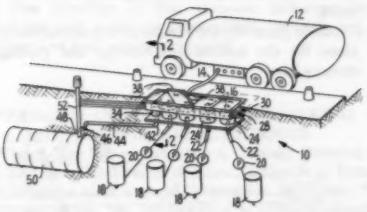
Filed Jan. 19, 1982, Ser. No. 340,805

Int. Cl.³ B65B *3/06*

U.S. Cl. 141—86 **11 Claims**

1. A volatile hydrocarbon fluid unloading header system for avoiding earth, water or air contamination by leakage or spillage from a delivery hose adapted to be connected between said system and a tank truck for said fluid, comprising at least one product unloading pot adapted to be connected to a storage tank through a pumping and pipe delivery system by a pipe outlet in the bottom of said unloading pot, a sump pot disposed parallel and adjacent to said product unloading pot, an open-top enclosure box overlying said unloading pot and said sump pot and having a bottom forming a closure plate for sealingly enclosing the tops of each of said pots, a tank truck hose connector secured to said closure plate and communicating with

the top of said unloading pot, a vapor recovery vent formed in said plate means communicating with the interior of said unloading pot and means forming an opening into said sump pot at a level below said hose connector to permit spillage that would otherwise fall on the ground or in water around said



unloading header to be withdrawn through said sump pot, an outflow line connecting said sump pot to a slop tank, and a vapor recovery system having a vapor recovery line communicating with said line from said sump pot to said slop tank and with said vapor recovery vent in said unloading pot.

4,457,350

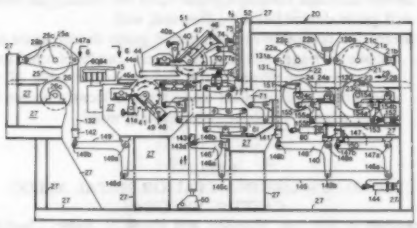
LUMBER PLANING MACHINE

John S. Finnila, 16223 143rd Pl. SE., Renton, Wash. 98055

Filed Jul. 3, 1980, Ser. No. 165,494

Int. Cl.³ B27C *1/08, 1/12*

U.S. Cl. 144—117 R **32 Claims**



1. A method of planing sawed lumber to automatically plane equal thicknesses of wood from both the top and bottom of the lumber and to plane sides of the lumber to produce a planed board of a specified cross sectional size, in so doing keeping the removed planed waste wood to a minimum amount, comprising the steps of:

(a) positioning a powered top planing cutter at a selectable planing height and at a location ahead of a bottom planing cutter to plane lumber to a preselected thickness;

(b) positioning a powered bottom planing cutter at a fixed planing height and at a location beyond the powered top planing cutter to plane lumber to the preselected thickness;

(c) positioning a pair of spaced side planing cutters at a selectable distance apart to plane lumber to a preselected width and at a location beyond the powered bottom planing cutter;

(d) positioning a first top platen at a height adjustable location ahead of the powered top planing cutter and locating the top platen to guide an oncoming board of sawed lumber to the powered top planing cutter for a specified minimum selected depth of a planing cut;

(e) positioning a first bottom platen at a height adjustable location ahead of the powered top planing cutter and at a location immediately below the first top platen for a specified minimum selected depth of a planing cut to be undertaken by the powered bottom planing cutter equalling the specified minimum selected depth of a planing cut to be undertaken by the powered top planing cutter;

(f) operating the powered top and bottom planing cutters and the side planing cutters;

(g) feeding a board of oncoming sawed lumber between the first top and first bottom platens;

(h) sensing any upward movement of the first top platen caused by the entering end of the oncoming board of sawed lumber;

(i) adjusting immediately the relative positions of the first top platen and first bottom platen so each platen is equally moved to center the oncoming board of sawed lumber between the planing cut depths of the respective powered top and bottom planing cutters thereby preparing for the equal planing cuts of the same depth of wood from the respective top and bottom of the board of lumber; and

(j) feeding the sawed lumber respectively past the operating powered top, bottom and side cutters, thereby planing the same depth of wood from the respective top and bottom of the board of lumber and planing wood from both sides of the board of lumber to produce a planed board of lumber of the preselected cross sectional size.

4,457,351

TILT ROD SUPPORT FOR VENETIAN BLIND ASSEMBLY

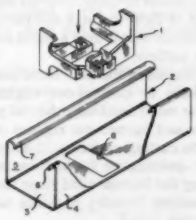
Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas, Inc., Totowa, N.J.

Continuation-in-part of Ser. No. 387,033, Jun. 10, 1982, which is a continuation-in-part of Ser. No. 290,259, Aug. 5, 1981, abandoned. This application Jun. 2, 1983, Ser. No. 500,389

Claims priority, application Canada, Jun. 9, 1982, 404836

Int. Cl.³ E06B *9/38*

U.S. Cl. 160—178 R **10 Claims**



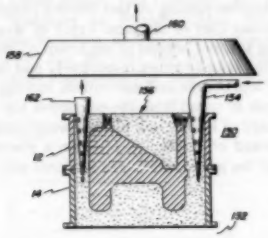
1. A tilt rod support adapted to be fitted into a venetian blind headrail having a channel-shaped cross-section including a lower web, said tilt rod support being made of a resilient material and comprising a base adapted to engage said web, two longitudinally spaced parallel upstanding legs on said base, each said leg having a vertical support portion comprising a bearing surface extending less than 180° of circumference, and the bearing surface of the vertical support portion of one leg facing in the opposite direction of the bearing surface of the vertical support portion of the other leg, said bearing surfaces being dimensioned and shaped to rotatably support a tilt rod, and said legs being dimensioned and shaped to receive a tilt rod therebetween when a rod is forced downwardly on said legs to cause said legs to spread radially outwardly from said rod to allow said rod to snap into place between said legs.

4,457,352

SYSTEM AND PROCESS FOR THE ABATEMENT OF CASTING POLLUTION, RECLAIMING RESIN BONDED SAND, AND/OR RECOVERING A LOW BTU FUEL FROM CASTINGS

Karl D. Scheffer, 121 Governor Dr., Scotia, N.Y. 12302

Continuation-in-part of Ser. No. 130,256, Mar. 14, 1980, Pat. No. 4,325,424. This application Apr. 19, 1982, Ser. No. 369,529
The portion of the term of this patent subsequent to Apr. 20, 1999, has been disclaimed.
Int. Cl.³ B22D *23/00, 27/15*
U.S. Cl. 164—5 **12 Claims**



1. An improved mold system including at least one nobake casting mold comprising a cope, a drag and a nobake foundry sand composition including an organic binding material, the improvement comprising first means connected to the mold for inducing a flow of air through the sand composition of the mold to aid combustion of the organic binding material to produce a low BTU content gas,

a second means connected to the mold for collecting at least the low BTU content gas,

means for mixing combustion air with the low BTU content gas to form a combustible mixture, and

means for burning the combustible mixture to generate thermal energy.

8. A method for casting molten metal in a nobake sand mold assembly comprising

(a) affixing a source of pressurized air to the mold assembly;

(b) causing air to flow through bonded sand of the nobake mold assembly;

(c) providing means to collect the air and any gaseous products caused to flow through the mold assembly;

(d) casting molten metal into a mold assembly while maintaining the airflow;

(e) heating portions of the sand mold assembly to a temperature sufficient to decompose organic binder materials bonding the mold sand together to produce a low BTU content gas and burned out regions of sand;

(f) cooling the casting in the mold assembly for a period of time while maintaining the airflow, and

(g) recovering the burned sand from the mold assembly for reuse in making foundry molding sand composition for casting molten metal.

4,457,353

STARTER APPARATUS FOR A CONTINUOUS CASTING PLANT, ESPECIALLY FOR CASTING STEEL STRANDS

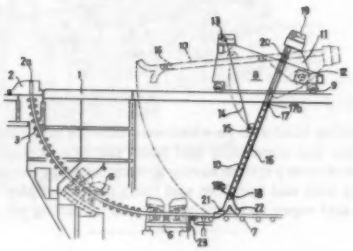
Heinz Meurer, Willich, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag AG, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 18, 1982, Ser. No. 434,913
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3143639
Int. Cl.³ B22D *11/08*
U.S. Cl. 164—426 **7 Claims**

1. In starter apparatus for a continuous casting plant, especially for casting steel strands, containing a continuous casting mold having a mold opening and an upper edge, a casting platform at which there is arranged the continuous casting mold, a curved strand guide arrangement following said continuous casting mold for guiding a cast strand received from the continuous casting mold, and a run-out roller table following said curved strand guide arrangement for the outfeed of the cast strand in a strand conveying plane, the improvement which comprises:

a flexible dummy bar provided at each end with a dummy bar head for closing the opening of the continuous casting mold;

a pivotable guide device pivotable in a substantially vertical plane for the intermediate storage and guiding of the dummy bar;



drive means for moving the dummy bar through the curved strand guide arrangement for closing the opening of the continuous casting mold by means of one or the other of the dummy bar heads;

mobile carriage means movable upon the casting platform;

said guide device having a free end; and

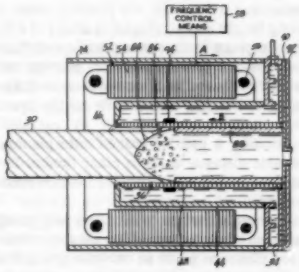
means for pivotably mounting said guide device upon said mobile carriage such that its free end can be pivoted from the conveying plane of the run-out roller table of the continuous casting plant up to a plane located above the upper edge of the continuous casting mold.

4,457,354

MOLD FOR USE IN METAL OR METAL ALLOY CASTING SYSTEMS

Jonathan A. Dantzig, Hamden, and Derek E. Tyler, Cheshire, both of Conn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,572
Int. Cl.³ B22D *11/00*
U.S. Cl. 164—468 **22 Claims**



10. A process for mixing a molten metal or metal alloy, said process comprising:

providing a mold for containing said molten metal or metal alloy, said mold comprising a thermally and electrically conductive material;

electromagnetically mixing said molten metal or metal alloy

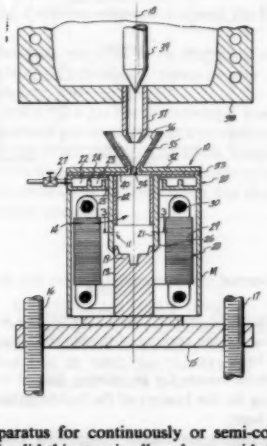
and thereby inducing electrical currents in a first direction in said containing means; wherein the improvement comprises:

minimizing the path lengths of at least some of said currents induced in said mold by providing a mold having a stack of metal laminations separated by electrical insulating material, said electrical insulating material being oriented so that its smaller dimension is substantially transverse to said first direction so that magnetic induction losses caused by said mold are substantially reduced and the efficiency of said mixing enhanced.

4,457,355
APPARATUS AND A METHOD FOR MAKING THIXOTROPIC METAL SLURRIES

Joseph Winter, New Haven; Jonathan A. Dantzig, Hamden, and Derek E. Tyler, Cheshire, all of Conn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 184,089, Sep. 4, 1980, abandoned, which is a continuation of Ser. No. 015,059, Feb. 26, 1979, abandoned. This application Oct. 26, 1983, Ser. No. 545,119
The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.
Int. Cl.³ B22D *27/02*
U.S. Cl. 164—468 **11 Claims**



1. In an apparatus for continuously or semi-continuously forming a semi-solid thixotropic alloy slurry, said slurry comprising throughout its cross section degenerate dendrite primary solid particles in a surrounding matrix of molten metal, said apparatus comprising:

means for containing molten metal, said containing means having a desired cross section;

means for controllably cooling said molten metal in said containing means; and

means for mixing said molten metal for shearing dendrites formed in a solidification zone as said molten metal is cooled for forming said slurry;

said mixing means comprising a single two pole stator for generating a non-zero rotating magnetic field which moves transversely of a longitudinal axis of said containing means across the entirety of said cross section of said containing means and over said entire solidification zone, said moving magnetic field providing a magnetomotive stirring force directed tangentially of said containing means for causing said molten metal and slurry to rotate in said containing means, said magnetic force being of sufficient magnitude to provide said shearing of said dendrites, said magnetomotive force providing a shear rate of at least 500 sec.$^{-1}$;

the improvement wherein, said containing means includes a first portion of low thermal conductivity and a second portion of high thermal conductivity, said portion of low thermal conductivity extending into said magnetic field for postponing solidification within said containing means until said molten metal is within said magnetic field, thereby promoting the formation of a degenerate dendritic structure throughout the slurry.

11. In a process for continuously or semi-continuously forming a semi-solid thixotropic alloy slurry, said slurry comprising throughout its cross section degenerate dendrite primary solid particles in a surrounding matrix of molten metal, said process comprising:

providing a means for containing molten metal having a desired cross section;

controllably cooling said molten metal in said containing means; and

mixing said contained molten metal for shearing dendrites formed in a solidification zone as said molten metal is cooled for forming said slurry;

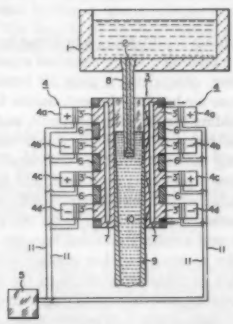
said mixing step comprising generating solely with a two pole stator a non-zero rotating magnetic field which moves transversely of a longitudinal axis of said containing means across the entirety of said cross section of said containing means and over said entire solidification zone, said moving magnetic field providing a magnetomotive stirring force directed tangentially of said containing means for causing said molten metal and slurry to rotate in said containing means, said magnetomotive force being of sufficient magnitude to provide said shearing of said dendrites, said magnetomotive force providing a shear rate of at least 500 sec.$^{-1}$;

the improvement wherein a first region of low thermal conductivity and a second region of high thermal conductivity is provided within said containing means, said region of low thermal conductivity postponing solidification during said mixing step until said molten metal is within said magentic field, thereby promoting the formation of a degenerate dendritic structure throughout the slurry.

4,457,356
METHOD OF VIBRATING CONTINUOUS CASTING MOLD

Nobuhisa Hasebe; Hiroshi Kawada, both of Yokohama, and Isamu Komine, Yokosuka, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP80/00308, § 371 Date Aug. 13, 1981, § 102(e) Date Aug. 13, 1981, PCT Pub. No. WO81/01808, PCT Pub. Date Jul. 9, 1981
PCT Filed Dec. 16, 1980, Ser. No. 293,210
Claims priority, application Japan, Dec. 21, 1979, 54-166364
Int. Cl.³ B22D *11/04*
U.S. Cl. 164—478 **3 Claims**



1. In a method of operating a continuous casting mold which comprises:

means defining a mold having side walls, said side walls having outer surfaces;

a plurality of ultrasonic vibrators fitted to the outer surface of each of said side walls of said mold along at least one straight line at prescribed intervals in the axial direction of said mold; and

a source of electrical power coupled to said plurality of ultrasonic vibrators for causing them to vibrate and produce vibration waves of identical wave lengths in the axial direction of said mold;

said prescribed intervals being equal to half the wave length of said vibration waves produced in the axial direction of said mold;

the improvement comprising:

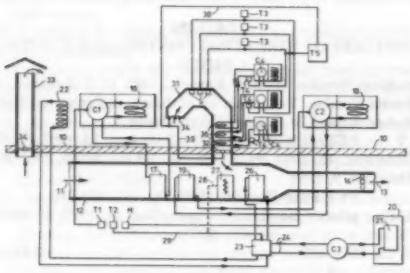
causing the phases of said vibration waves of two adjacent ones of said plurality of ultrasonic vibrators of each of said side walls to be deviated by 180° from each other, said two adjacent ones being in the axial direction of said mold.

4,457,357

AIR-CONDITIONING APPARATUS

Peter D. Van Arnhem, 2446 Cawthra Rd., Mississauga, Ontario, Canada L5A 3K6

Filed Jan. 12, 1982, Ser. No. 338,914
Int. Cl.³ F24F *3/14*
U.S. Cl. 165—21 **12 Claims**



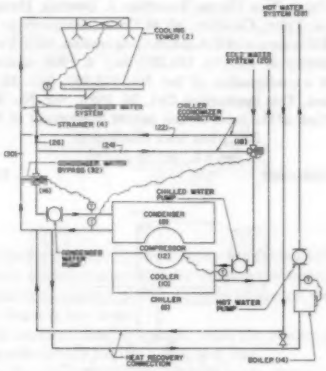
1. Apparatus for air-conditioning a building having refrigeration equipment including cooling elements exposed to the air within the building, comprising a main air treatment unit including at least one air-heating element, means for circulating air within the building through the main unit, and a thermostat responsive to the temperature of air within the building to actuate the heating element when the temperature within the building falls below a predetermined limit, and an auxiliary air treatment unit including at least one air-cooling and dehumidifying element, means for passing air from the outside of the building through said auxiliary unit and into the building, and auxiliary controller means located in contact with the outside air and responding to moisture content of the outside air to actuate said air-cooling and dehumidifying element when said moisture content rises above a pre-determined limit thereof, said auxiliary controller means being directly operatively connected to said auxiliary unit and actuating the latter independently of the conditions existing within the building.

4,457,358

HEATING AND COOLING SYSTEM

Edward A. Kriege; Paul J. Marshall, and Robert B. Tuckett, all of St. Louis, Mo., assignors to Engineering Design and Management Inc., St. Louis, Mo.

Continuation of Ser. No. 249,441, Mar. 31, 1981, abandoned.
This application Aug. 8, 1983, Ser. No. 520,905
Int. Cl.³ F24F *3/00*; F24D *17/02*
U.S. Cl. 165—50 **2 Claims**



1. An internal environmental system for buildings which comprises:

(a) A circuit means for circulating chilled water through a building for the cooling of the building through the transfer of heat;

(b) A circuit means for circulating heated water through a building for the heating of the building through the transfer of heat;

(c) A refrigeration means comprising condenser means, compressor means and cooler means connected to the chilled water circuit for selectively transferring heat from said chilled water circuit to said heated water circuit or to a cooling tower means;

(d) A means for selectively diverting water from said chilled water circuit to said cooling tower means;

(e) A means for selectively routing water from said cooling tower means to a filtering means or to the condensor means of the refrigeration means;

(f) A means for selectively routing the water existing said filtering means to the condenser means of the refrigeration means or said chilled water circuit;

(g) A means for selectively routing portions of the water exiting the condenser means of the refrigeration means to said heated water circuit, to the cooling tower means, or back to the condenser means of the refrigeration means; and

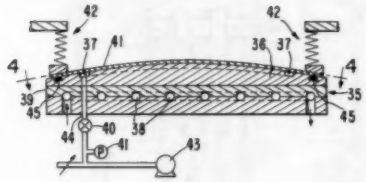
(h) A means for selectively routing portions of the water from the heated water circuit to the cooling tower means or to said condenser means wherein when the water from the heated water circuit is routed to said condenser means all or part of the water exiting said filtering means can be routed to the chilled water circuit.

4,457,359

APPARATUS FOR GAS-ASSISTED, SOLID-TO-SOLID THERMAL TRANSFER WITH A SEMICONDUCTOR WAFER

Scott C. Holden, Manchester, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed May 25, 1982, Ser. No. 381,669
Int. Cl.³ F28F 9/00
U.S. Cl. 165—80 C 17 Claims



1. Apparatus for effecting thermal transfer with a thin flexible disk in vacuum, comprising:

a platen having a nonplanar surface for receiving said disk and forming a solid-to-solid contact with the back side of said disk;

means for clamping said disk at its periphery against said platen surface to produce a platen-to-disk preloading contact pressure; and

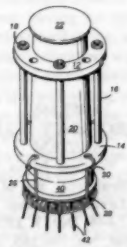
means for introducing a gas into microscopic voids between said disk and said platen surface at a predetermined pressure above the level sufficient to cause bowing and reduced thermal transfer with a disk which is not preloaded, said predetermined gas pressure being less than said preloading contact pressure.

4,457,360

MULTI-LEAD HEAT SINK

Lars D. Roose, Albuquerque, N. Mex., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 25, 1982, Ser. No. 411,393
Int. Cl.³ B23K 3/00
U.S. Cl. 165—80 B 6 Claims



2. An apparatus comprising:

expandable and contractable means for encircling and physically contacting the leads of an electronic device;

said lead encircling means comprising a loop of coiled spring;

housing means;

means for attaching said lead encircling means to said housing means; and

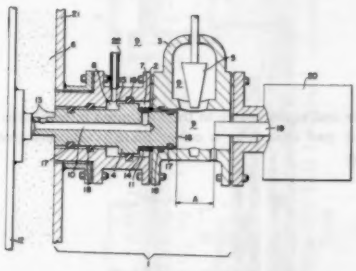
means extendable from said housing for expanding and contracting said lead encircling means.

4,457,361

CONNECTION ELEMENT FOR THE TRANSFER OF KNOCK- OR IMPACT-ENERGY UPON HEATING OR COOLING SURFACES TO BE CLEANED AND LOCATED IN A PRESSURE VESSEL

Ulrich Premel, and Gustav Thönes, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Jul. 13, 1982, Ser. No. 397,849
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1981, 3127734
Int. Cl.³ F28D 11/06; F28G 7/00
U.S. Cl. 165—84 7 Claims



1. An apparatus for transfer of knock- or impact-beating energy from a mechanically, hydraulically or pneumatically operated and driven knock- or impact-beating device onto heating or cooling surfaces to be cleaned intermittently, whereby the heating or cooling surfaces are installed in a container operated on a gaseous side thereof at a pressure elevated with respect to atmospheric environmental pressure, the surfaces having an external flow of hot, dust-laden gases thereagainst, and the knock- and impact-beating device including a transfer piston and being fastened externally of the pressure container, comprising:

a pressure-compensating and equalizing connection element connected between the mechanically, pneumatically or hydraulically driven and operated knock- or impact-beating device and the heating- or cooling surface to be cleaned, said connection element including housing means, an energy transfer element, and a shut-off element, said energy transfer element having a compensating and equalizing means connected with two pressure chambers therewith, sealing elements to separate the pressure chambers from each other and to seal against the housing means, and a spring means to press equal, pressure loadable surfaces therewith against the heating and cooling surface, and having a spaced distance from the transfer piston of the knock- or impact-beating device dependent upon available maximum knock- or impact-beating energy.

4,457,362

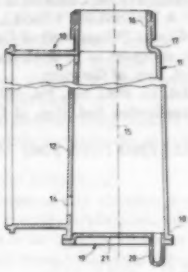
WATER BOX AND EXPANSION CHAMBER ASSEMBLY

Patrick Cadars, Montigny le Bretonneux, France, assignor to Valeo, Paris, France

Filed Mar. 9, 1982, Ser. No. 356,431
Claims priority, application France, Apr. 2, 1981, 81 06674
Int. Cl.³ F28D 13/00
U.S. Cl. 165—104.32 13 Claims

1. A combination water box and expansion chamber for a heat exchanger including a unitary plastic body divided into at least two portions separated by a commmon wall, the first portion constituting a water box and including means defining an opening in said common wall in communication with the second portion constituting an expansion chamber, said expansion chamber having a generally tapered cross section throughout its length and terminating at its smaller end in a

filler neck configured to receive a removable closure member, said expansion chamber further including an opening at its



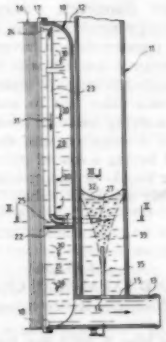
opposite end equal in size to the maximum internal size of the chamber and closed by a cover plate positioned over said opening.

4,457,363

WATER BOX AND EXPANSION CHAMBER STRUCTURE FOR A HEAT EXCHANGER

Denis Villeval, Maurepas, France, assignor to Valeo, Paris, France

Filed May 4, 1982, Ser. No. 374,796
Claims priority, application France, May 12, 1981, 81 09442
Int. Cl.³ F01P *11/02*
U.S. Cl. 165—104.32 **7 Claims**



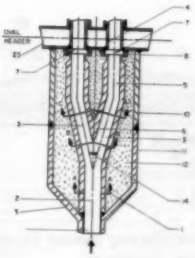
1. A water box and expansion chamber structure for a heat exchanger, in particular for a radiator in a motor vehicle, wherein the expansion chamber and the water box are interconnected by a degassing conduit or orifice, wherein the expansion chamber has a suction orifice, and wherein means are provided in the expansion chamber to slow down or prevent rotational motion of the liquid in the expansion chamber in the vicinity of the suction orifice, said means comprising at least one radially inwardly directed fin or rib extending vertically along the inside wall of the expansion chamber.

4,457,364

CLOSE-COUPLED TRANSFER LINE HEAT EXCHANGER UNIT

Arthur R. DiNicolantonio, Whippany, N.J., and Bill Moustakakis, Waterloo, Belgium, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 18, 1982, Ser. No. 359,197
Int. Cl.³ F28F *9/00*
U.S. Cl. 165—134 R **21 Claims**



1. A transfer line heat exchanger unit, close coupled to a furnace, in which hot gas flows from a furnace outlet into heat exchange tubes for cooling said gas which comprises heat exchange tubes of tube-in-tube construction, a connector connected at its upstream end to a furnace outlet and having an inlet for said gas and two diverging branches forming with said connector a wye for passage of gas, the ratio, R, of the sum of the cross-sectional areas of the branches to the cross-sectional area of the connector being from about 1:1 to about 2:1 and each branch being in fluid flow communication with a respective cooling tube, said cooling tubes being tube sheet-free, the cross-sectional area of each branch being substantially the same as the cross-sectional area of the respective cooling tube.

4,457,365

IN SITU RADIO FREQUENCY SELECTIVE HEATING SYSTEM

Raymond S. Kasevich, Weston; Myer Kolker, Bedford, and Arthur S. Dwyer, Braintree, all of Mass., assignors to Raytheon Company, Lexington, Mass.

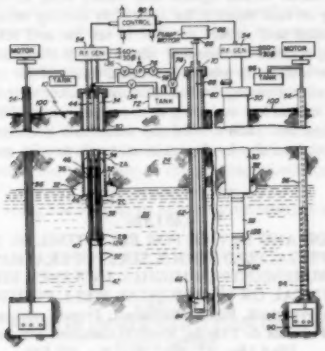
Division of Ser. No. 967,446, Dec. 7, 1978, Pat. No. 4,301,865, which is a division of Ser. No. 756,165, Jan. 3, 1977, Pat. No. 4,140,179. This application Aug. 10, 1981, Ser. No. 291,667
Int. Cl.³ E21B *36/04, 43/24*
U.S. Cl. 166—60 **27 Claims**

1. A system for producing subsurface heating of a formation comprising:

a plurality of groups of predetermined spaced radiators extending through an overburden into a region to be heated; and

means for supplying said radiators with electrical energy at intensities and a frequency which produce electrical fields directed toward a common region in said formation which

heat selected organic portions of said formation at a more rapid rate than said heat is transferred by conduction from



said organic portions to predominantly inorganic portions of said formation adjacent to said organic portions.

4,457,366

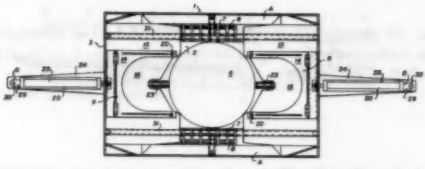
WIPER DEVICE FOR STRIPPING FLUID FROM WELL PIPE

William H. Brown, Edmonton, Canada, assignor to Trevor F. Cuthill; Brian H. Briscoe and Lloyd W. McLaren, all of Edmonton, Canada, part interest to each

Continuation-in-part of Ser. No. 427,965, Sep. 29, 1982, abandoned. This application Sep. 30, 1983, Ser. No. 537,330

Int. Cl.³ E21B *33/08*

U.S. Cl. 166—82 **14 Claims**



1. In a wiper device for stripping fluid from the outer surface of a well string as it emerges from a well bore, said device comprising a container having an opening for the passage therethrough of a vertical well string, a pair of opposed, vertically spaced, horizontally disposed wiper pads positioned in the container and adapted to be moved longitudinally to engage opposite sides of the well string, a pair of cylinder means for closing said wiper pads onto the well string by moving them longitudinally, the sides of the container being spaced from the wiper pads to permit of transverse movement of said pads in a horizontal plane as the string sways laterally and the pads follow it, the improvement comprising:

two vertically spaced layers of anti-friction means, mounted to the container and each arranged to support one of the wiper pads, for facilitating universal movement of the pad in a horizontal plane;

said cylinder means comprising a pair of cylinders associated with the container, each such cylinder having its inner end connected with one of the wiper pads and being pivotally supported adjacent its outer end so as to permit of rotation of the inner end of said cylinder in a horizontal plane, whereby the associated wiper pad may move laterally to follow the well string, said cylinder being disposed substantially in the same horizontal plane as the wiper pad with which it is associated.

4,457,367

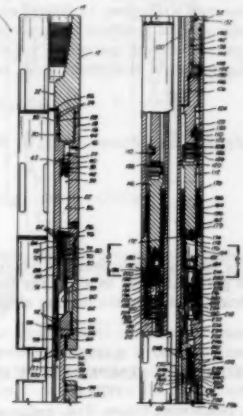
DOWNHOLE PUMP AND TESTING APPARATUS

John T. Brandell, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 255,252, Apr. 17, 1981, Pat. No. 4,366,862, which is a continuation of Ser. No. 204,057, Nov. 4, 1980, Pat. No. 4,372,387, and Ser. No. 204,058, Nov. 4, 1980, Pat. No. 4,386,655, each is a division of Ser. No. 57,093, Jul. 12, 1979, Pat. No. 4,246,964. This application Aug. 26, 1982, Ser. No. 411,800

Int. Cl.³ E21B *33/127, 41/00*; **F04B** *1/16, 37/10*

U.S. Cl. 166—105 **7 Claims**



1. A downhole pump, comprising:

a piston housing;

a plurality of piston assemblies disposed in said piston housing, each including a piston reciprocatingly disposed in a cylinder;

a valve body connected to said piston housing;

a plurality of inlet poppet assemblies disposed in said valve body, one of said inlet poppet assemblies being located below and communicated with each of said cylinders for controlling a fluid intake to said cylinders;

a plurality of outlet poppet assemblies, one of said outlet poppet assemblies being located below and communicated with each of said cylinders for controlling a fluid discharge from said cylinders; and

a master outlet check valve assembly located below and communicated with all of said outlet poppet assemblies, for preventing discharge fluid from flowing back to said outlet poppet assemblies, wherein said master outlet check valve assembly includes a plurality of alternating annular sealing rings and annular separator rings disposed in a first annular cavity communicated with all of said outlet poppet assemblies.

4,457,368

SHEARABLE NO GO INSERT FOR A WELL LOCK

Jeffrey L. Knierimen, Stafford, and Mark S. Fuller, Houston, both of Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Mar. 25, 1983, Ser. No. 478,741

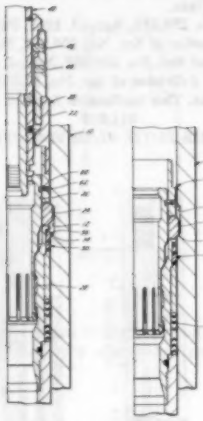
Int. Cl.³ E21B *23/02*

U.S. Cl. 166—217 **5 Claims**

1. In a well lock adapted to lock in a locking notch in a landing nipple in a well in which the lock includes a no go shoulder for contacting a landing nipple shoulder for allowing a setting wedge to be moved, after shearing setting shear means, for actuating locking dogs into the locking notch, the improvement in the no go shoulder comprising,

said no go shoulder being of a shearable material having a

shear strength load capacity greater than the shear strength load capacity of the setting shear means but less



than the landing nipple shoulder whereby the strength of the no go is sufficient to allow the lock to be set but is insufficient to deform the landing nipple shoulder.

4,457,369

PACKER FOR HIGH TEMPERATURE HIGH PRESSURE WELLS

William D. Henderson, Frisco, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 17, 1980, Ser. No. 217,228
Int. Cl.³ E21B *33/129*
U.S. Cl. 166—125 **17 Claims**

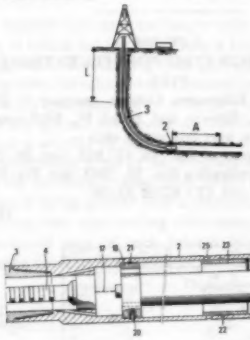
1. A well packer comprising: a tubular mandrel; a longitudinally compressible radially expandible seal assembly on said mandrel for sealing around said mandrel with a casing wall around said packer; deformable upper and lower retainer means on said mandrel at upper and lower ends of said seal assembly for radial expansion against said casing wall to contain said seal assembly at high temperatures and pressures; ring means at the lower end of said lower retainer means including an outer ring member movable longitudinally away from said lower retainer means to produce an external annular gap around said mandrel below said lower retainer means to receive downward and inward folding of said lower retainer means when pulling said packer to relieve wedging of said lower retainer means against said casing wall; an upper slip assembly on said mandrel for releasably locking with a casing wall around said packer adapted to set last and release first including a collet wedge and slips slidable along said collet wedge; a lower slip assembly on said mandrel for releasably locking with a casing wall around said packer adapted to set first and release last including an expander wedge slidable into lower slips; and each of said slip assemblies including a one-piece C-shaped slip having external teeth to grip said casing wall.

4,457,370

METHOD AND DEVICE FOR EFFECTING, BY MEANS OF SPECIALIZED TOOLS, SUCH OPERATIONS AS MEASUREMENTS IN HIGHLY INCLINED TO THE VERTICAL OR HORIZONTAL WELL PORTIONS

Christian Wittrisch, Rueil Malmaison, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Mar. 12, 1982, Ser. No. 357,519
Claims priority, application France, Mar. 13, 1981, 81 05271
Int. Cl.³ E21B *23/08, 43/112, 47/00*
U.S. Cl. 166—250 **18 Claims**



1. A method for effecting logging or servicing operations in a predetermined zone of a bore hole having, from the ground surface downwardly, an initial portion substantially vertical or of slight inclination, followed by an inclined or horizontal portion, with said predetermined zone being located beyond said initial portion of the well, the method comprises the steps of, (a) fixedly securing at the ground surface a logging or servicing tool body to the lower end of a first rod of a string of rods, with said tool body being electrically connected to a first electric connector rigidly secured to said first rod and accessible from the upper portion thereof, (b) assembling the string of rods, by end-to-end connection of new drill rods above the first rod, and progressively lowering the assembly of the tool body and the string of rods into the well as it is assembled, and in the absence of an external conduit extending within said bore hole from the ground surface to said predetermined measuring zone, for supporting, at its lower end, said string of rods after assembled, (c) introducing a second plug-in electric connector for use in a liquid medium, in the string of rods, from the surface, with said second connector being mechanically secured to the lower end of an electric transmission cable and electrically connected to the surface through said cable, and with said method further comprising:

(1) lowering said second connector, secured to said cable and weighted, into the string of rods when the tool body is positioned substantially at the predetermined zone of the well, by sliding the cable through a sealing member secured at the surface to the string of rods, and with said

sealing member comprising a special sub with a lateral port through which the cable is passed, and which is secured to the upper end of the string of rods;

(2) displacing said second connector through the inclined or horizontal portion of the string of rods by pumping a fluid through the string of rods from the surface in a manner so as to exert a moving force on said second connector until said second connector operatively connects to said first connector;

(3) displacing the tool through the well by adding a tubular string of rod elements above the special sub to thereby position the tool body in the predetermined zone of the well; and

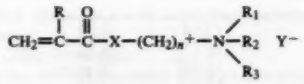
(4) effecting the logging or servicing operation in said zone.

4,457,371
METHOD FOR DEMULSIFICATION OF BITUMEN EMULSIONS

David R. McCoy; Edward E. McEntire, and Robert M. Gipson, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 2, 1981, Ser. No. 326,455
Int. Cl.³ E21B *43/24, 43/40*
U.S. Cl. 166—267 **2 Claims**

1. A process for recovering petroleum from O/W bitumen emulsions by demulsifying said emulsions by adding thereto demulsifiers comprising co-polymers of monomers having the general structure



where=H or lower alkyl, X=NH or O, n=>1, R_1 and R_2=alkyl, R_3=alkyl, alkenyl, alkylaryl, or hydroxyalkyl, and Y=an anion wherein the co-polymer contained about 60% or greater of said monomer.

4,457,372
METHOD OF RECOVERING PETROLEUM FROM UNDERGROUND FORMATIONS

Martha S. Doster; Alton J. Nute, both of Houston, Tex., and Charles A. Christopher, Broken Arrow, Okla., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 6, 1981, Ser. No. 318,784
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—274 **4 Claims**

1. A method for recovering petroleum from a subterranean petroleum-containing formation wherein there is at least one injection well penetrating and in communication with the formation and at least one production well penetrating and in communication with the formation by injection of an aqueous fluid through the formation from the injection well to the production well and producing petroleum and aqueous fluids through the production well and wherein the said injected aqueous fluid comprises a hydrated polysaccharide in sufficient concentration to increase the viscosity of the aqueous fluid, said polysaccharide being of the scleroglucan group of homopolysaccharides; said hydrated polysaccharide thickened with from about 0.5 wt% to about 25 wt% of a water soluble guanidine compound selected from the group consisting of guanidine hydrochloride, guanidine acetate, guanidine sulfate, guanidine carbonate, guanidine thiocyanate and guanidine nitrate; and about 25 wt% of NaCl.

4,457,373
PROCESS FOR OIL RECOVERY FROM SUBTERRANEAN DEPOSITS BY EMULSION FLOODING

Dieter Balzer, and Kurt Kosswig, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels, A.G., Marl, Fed. Rep. of Germany

Filed Feb. 18, 1982, Ser. No. 349,945
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1981, 3105913
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—274 **12 Claims**

1. A process for recovering extensively emulsion-free oil from a subterranean deposit of medium or high salinity comprising injecting a water-oil emulsion into an injection well wherein the emulsifier comprises an effective amount of a mixture of 0–90 wt. % of ethoxylates of the formula

$$R—(OCH_2CH_2)_nOH$$

and 100–10 wt. % of carboxymethylated ethoxylates of the formula

$$R—(OCH_2CH_2)_n—OCH_2—COOM$$

wherein

R is a hydrocarbon aliphatic group of 6–20 carbon atoms or a mono- or dialkylphenyl group of 3–14 carbon atoms in the alkyl group,

n is 1 to 30, and

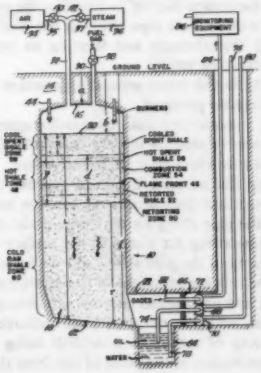
M is an alkali or alkaline earth metal ion or ammonium,

wherein said emulsifier is selected so that the phase inversion temperature of the system:deposit oil/formation water-/emulsifier lies 0°–10° C. above the deposit temperature.

4,457,374
TRANSIENT RESPONSE PROCESS FOR DETECTING IN SITU RETORTING CONDITIONS

George R. Hoekstra, Bolingbrook, and John M. Forgac, Elmhurst, both of Ill., assignors to Standard Oil Company, Chicago, Ill.; Gulf Oil Corp., Pittsburgh, Pa.

Filed Jun. 29, 1982, Ser. No. 393,432
Int. Cl.³ E21B *43/247, 47/06*
U.S. Cl. 166—251 **43 Claims**



1. A process for use in underground retorting of oil shale, comprising the steps of:

igniting a flame front in an underground retort of raw oil shale to form a hot zone;

liberating shale oil and off gases from said raw oil shale in said hot zone with heat emitted from said flame front, leaving retorted oil shale containing residual carbon;

combusting said residual carbon on said retorted shale with said flame front to form spent oil shale;

advancing said flame front through a portion of said raw oil shale;

supporting said flame front and said advancement with an oxygen-containing gas under a first set of feed conditions;

changing said feed conditions; and

determining the thickness of said hot zone by monitoring said off gases in response to the change of feed conditions.

4,457,375

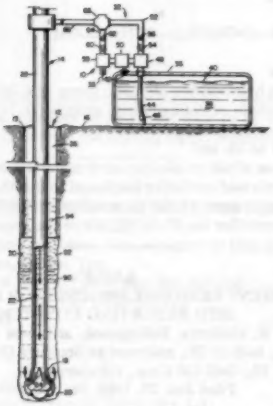
FOAM GENERATING DEVICE FOR WELLS

Mark A. Cummins, 305 Delmas, Lufkin, Tex. 75901

Continuation-in-part of Ser. No. 181,716, Aug. 27, 1981, Pat. No. 4,318,443, which is a continuation of Ser. No. 933,595, Aug. 14, 1978, abandoned. This application Mar. 5, 1982, Ser. No. 355,136

Int. Cl.³ E21B *7/18*

U.S. Cl. 166—309 **4 Claims**



1. A method for generating and circulating foam within a well during formation thereof comprising the steps of:

disposing a down hole pipe string in the well having a passageway therethrough and forming an annular channel around the pipe string;

pressurizing liquid foam generating solution with a selectively variable pressure;

entraining a pressurized gaseous aeration agent with a selectively variable pressure into the flow of liquid foam generating solution through a mixing structure;

discharging the mixed pressurized gaseous aeration agent and pressurized foam generating solution into the passageway in the pipe string for discharge at the down hole end of the pipe string for return to the surface in the annular space between the pipe string and well wall; and

varying the relative pressures of the liquid foam generating solution and pressurized gaseous aeration agent to generate foam, with the onset of foam occurring within the passageway of the down hole drill string and with the foam consistency at the point of exit from the passageway in the pipe string into the well variable by selective variation of the solution and agent pressures as a function of the frictional turbulence in the passageway in the pipe string and the back pressure in the annular channel around the pipe string such that the increase in the length of the path the aerated flow travels down hole causes the foam cells produced to divide into smaller cells, thereby increasing the density of the foam flow.

4,457,376

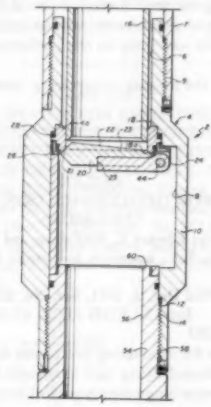
FLAPPER TYPE SAFETY VALVE FOR SUBTERRANEAN WELLS

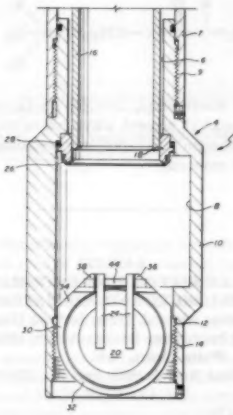
Michael A. Carmody, Broken Arrow, and Michael L. Cognevicy, Tulsa, both of Okla., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed May 17, 1982, Ser. No. 378,925

Int. Cl.³ E21B *34/14*

U.S. Cl. 166—332 **17 Claims**





2. A flapper type well control valve for opening and closing a subterranean tubular fluid transmission conduit comprising in combination: a tubular housing having an eccentric bore, a longitudinally movable cylindrical actuating sleeve; a downwardly facing, annular conical valve seat, a generally cylindrical flapper base abutting the upstream side of said valve seat; an eccentric projecting flange on said flapper base for pivotally mounting a flapper type valve closure member; cylindrical support means attachable to said tubular housing base and engaging said flapper base to secure said flapper base and said valve seat in said tubular housing, the width of said flange being no greater than the external diameter of the generally cylindrical flapper base, and a circular valve closure flapper having an annular peripheral conical surface cooperable with said valve seat and an elevated top surface on that portion of the flapper remote from pivotal mounting means for initial engagement with said actuating sleeve to initiate opening

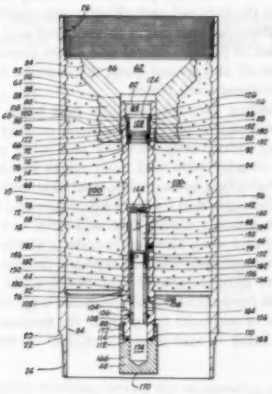
movement of said flapper upon longitudinal movement of said actuating sleeve.

4,457,377

SLIDING VALVE FLOAT COLLAR

Wesley J. Burris, II, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 3, 1982, Ser. No. 414,758
Int. Cl.³ E21B *34/14*
U.S. Cl. 166—332 **13 Claims**



1. A float collar for use in cementing operations in wells comprising:

a float collar comprising:

an annular cylindrical member having a threaded portion on one end on the exterior thereof and a threaded portion on the other end on the interior thereof; and

a sliding type valve assembly contained within the float collar comprising:

a guide member comprising:

an annular cylindrical member having, on the exterior thereof,

a first cylindrical surface,

a frusto-conical annular surface, and, on the interior thereof,

a frusto-conical annular guide surface,

a cylindrical surface, and

a threaded surface;

a valve mandrel including a part therein and having one end thereof secured to the guide member;

a valve seal sleeve located within the valve mandrel;

a sliding valve member located within the valve mandrel for opening and closing said part; and

a cap secured to the other end of the valve mandrel.

4,457,378

FLOWLINE PULL-IN APPARATUS AND METHOD

Bruce J. Watkins, Palos Verdes, Calif., assignor to Hughes Tool Company, Houston, Tex.

Filed Jul. 26, 1982, Ser. No. 402,178
Int. Cl.³ E21B *43/01*
U.S. Cl. 166—347 **7 Claims**

6. A flowline pull-in apparatus operable from an overhead vessel for remotely transporting flowlines to a subsea wellhead, comprising in combination:

flowline sled means, disposed on the sea floor, for supporting ends of said flowlines as said sled means is pulled across said sea floor, said flowline sled means having a seat;

a frame adapted to fit within the seat of said flowline sled means;

means for connecting said frame to a pipe string run from said vessel to allow said vessel to lift said frame away from the seat of said sled means and land said frame upon said wellhead;

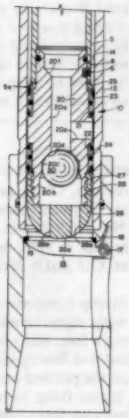
winch means, including a driven drum, disposed on said frame and connected to said sled means by a cable, for playing out said cable as said frame is moved from said flow line sled means to said wellhead and for pulling said sled means across said sea floor to said wellhead after said frame has landed on said wellhead, by winding said cable about said drum.

4,457,379

METHOD AND APPARATUS FOR OPENING DOWNHOLE FLAPPER VALVES

David M. McStravick, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Feb. 22, 1982, Ser. No. 350,906
Int. Cl.³ E21B *34/14*
U.S. Cl. 166—373 **9 Claims**



1. The method of opening a downhole hinged flapper valve disposed in a closed position in a subterranean well with the

pressure below the flapper valve acting to keep the flapper valve closed, comprising the steps of:

(1) positioning a check valve above the closed flapper valve, the check valve preventing upward fluid flow therethrough;

(2) moving the check valve toward the closed flapper to trap fluid between the check valve and the flapper valve; and

(3) applying a downward force on the check valve greater than the force acting to keep the flapper valve closed, with additional force on the check valve increasing the pressure of the fluid between the check valve and the flapper valve until the pressure force acting to open the flapper valve exceeds the force acting to keep the flapper valve closed.

4,457,380

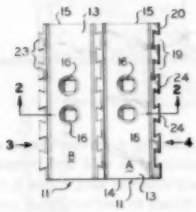
BLADES FOR EARTH MOVING MACHINES

John N. Curry, 148A Northern Rd., Heidelberg West, Victoria 3081, Australia

Filed Jun. 3, 1981, Ser. No. 270,090

Int. Cl.³ E02F *9/28*

U.S. Cl. 172—701.3 **10 Claims**



1. A pair of cutting edge members adapted to be fastened to a blade-like support member of an earth moving machine, said pair comprising a female cutting edge member and a male cutting edge member, each having ground-engaging edges at its opposite ends, the female cutting edge member having in at least one of its opposite side edges female interlocking means for engagement by complementary means on the male cutting edge member and the male cutting edge member having on at least one of its opposite side edges male interlocking means for interlocking engagement with said female interlocking means of the female cutting edge member, the said female and male interlocking means being so arranged that one cutting edge member may be adjusted linearly in position on the support member of the earth moving machine relative to the adjacent at least one cutting edge member and may also be reversed in position end-for-end and interlocked again with that adjacent cutting edge member so as to be adapted to be fastened again to said support member of said earth moving machine.

4,457,381

STUBBLE MULCH SWEEP

Halsey J. Wetmore, Guymon, Okla., assignor to Adams Hard-Facing Company, Inc., Guymon, Okla.

Continuation of Ser. No. 315,912, Oct. 28, 1981, abandoned. This application Sep. 6, 1983, Ser. No. 529,525

Int. Cl.³ A01B *39/20*

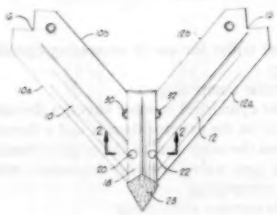
U.S. Cl. 172—722 **1 Claim**

1. A stubble mulch sweep comprising:

a pair of divergent wing plates terminating in parallel inner edges abutting along a line, said wing plates each having a pointed forward end and having convergent forward side edges converging at the pointed forward ends of said wing plates, said wing plates lying in two planes intersecting each other adjacent said line of abutment, which planes define a downwardly opening obtuse angle, each of said wing plates having a convexly curved upper surface, and each of said wing plates further having rear side edges extending substantially parallel to said forward side edges, and each of said wing plates defining a bifurcation located intermediate its forward side edge and its rear side edge, and each further defining a first bolt hole with the first bolt holes in the two wing plates located on opposite sides of said abutting inner edges;

a central overlay of V-shaped transverse cross-sectional configuration contacting the upper side of said wing plates and including parts lying in two planes extending parallel to the two planes in which said wing plates lie, and having holes formed therethrough in alignment with said first bolt holes in said wing plates, said overlay extending from adjacent the forward ends of said wing plates past the rear of the abutting inner edges thereof, and said overlay having a pair of parallel lateral side edges disposed on opposite sides of, and spaced from, the abutting inner edges of said divergent wing plates;

bolts extending through said first bolt holes in said wing plates and said holes in said central overlay and detachably and individually securing said wing plates to said central overlay with said inner edges located in the described abutting relationship, said first bolt holes being spaced between said forward side edges and said rear side edges at a location such that said bolts and the abutting status of said wing plates cooperate to stably support said plates beneath said overlay without further bolting to a frog, yet permit each of said plates to be individually removed from said frog and replaced with the removal of only one of said bolts and without the necessity for removing the other of said wing plates, and further permitting



said overlay to be removed from said wing plates without detachment or removal of said wing plates when said wing plates are bolted to a frog; and

a forward point of hard abrasion-resistant metal secured to the forward end of said central overlay and positioned to overlie and protect the foremost parts of said wing plates, said forward point having a forward tip which lies ahead of, and is positioned at least as low as, the pointed forward ends of said wing plates, and said point further having side portions extending rearwardly from said forward tip along the convergent forward side edges of said wing plates, and being disposed at least as low as said convergent forward side edges of said wing plates whereby said point diverts soil from contact with the forward ends of said wing plates and a portion of the convergent forward side edges thereof adjacent said forward ends, said point sloping upwardly and rearwardly from said forward tip to a location over the central axis of said central overlay;

each of said divergent wing plates defining a second bolt hole spaced rearwardly therealong from the respective first bolt hole in the respective wing plate and disposed immediately adjacent a lateral side edge of said central overlay to facilitate bolting of said stubble mulch sweep to the frog of an implement by extension of bolts through said second bolt holes in said wing plates at a location abutting and stabilizing said overlay whereby each of said wing plates may be debolted from the implement frog and from said overlay without detaching the other of said wing plates from said frog, and whereby said overlay may

be debolted from said wing plates and replaced without debolting either of said wing plates from the frog, and whereby both of said wing plates may be debolted from said frog with said overlay remaining bolted to said wing plates.

4,457,382

DEVICE FOR SUPPORTING AND GUIDING A WORKING TOOL

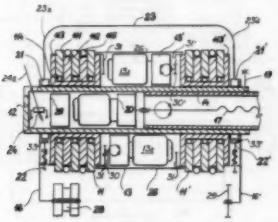
Milan Tolanda, Libina, Czechoslovakia, assignor to Vitkovice, Unicovske strojirny koncernovy podnik, Unicov, Czechoslovakia

Filed Sep. 30, 1982, Ser. No. 431,122

Claims priority, application Czechoslovakia, Oct. 2, 1981, 7223-81

Int. Cl.³ E21B *7/02*

U.S. Cl. 173—22 **10 Claims**



1. A portable working device for supporting and guiding a working tool, comprising a bogie having a single axle, a plurality of sets of supporting traveling wheels rotatably supported on the axle, an independent drive for each of the sets of supporting traveling wheels, said independent drives being disposed radially inwardly of the circumference of the supporting traveling wheels, each of the supporting traveling wheels being formed by magnets provided with at least two pole shoes, at least one supporting arm for a tool holder of a working tool, and means for opposing the torque reaction of the working device arranged on the bogie axle.

4,457,383

HIGH TEMPERATURE SELECTIVE FIRE PERFORATING GUN AND SWITCH THEREFOR

Gene T. Boop, 109 Kenshire, Ft. Worth, Tex. 76126

Filed Apr. 27, 1982, Ser. No. 372,152

Int. Cl.³ E21B *43/116*; H01H *9/00*

U.S. Cl. 175—4.55 **12 Claims**

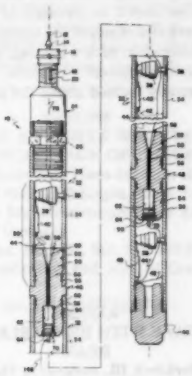
1. A perforating gun comprising

a plurality of normally disarmed electrically fireable initiator-perforating element assemblages and means providing an armed electrically fireable initiator-perforating element assemblage; and means for sequentially firing the assemblages including

circuit means including first and second elongate electrical conductors for providing electrical communication between the earth's surface and the perforating gun when it is run in a well for electrically firing any armed assemblage; and

a switch unit associated with each disarmed assemblage for electrically separating the initiator thereof from contact with at least one of the electrical conductors and responsive to firing of an adjacent assemblage for arming the associated assemblage including means placing the initiator of the associated assemblage in circuit with the firing circuit means including the first and second electrical conductors;

the switch unit comprising a first terminal connected to the associated initiator-perforating element assemblage; a second terminal connected to a first adjacent assemblage; a third terminal connected to a second adjacent assemblage; a housing having a chamber therein receiving a flowable material; means for applying pressure to the flowable material including a piston assembly having an electrically conducted component comprising one of the terminals; a projectile, in the chamber, exposed to the flowable material and propelled thereby from a first position toward a second position, the projectile being electrically connected to the conductive



component in the first projectile position and electrically separated therefrom in the second projectile position; a first circuit, including the projectile in the first position thereof, through the switch connecting the second and third terminals; and a second circuit, including the projectile, in the second position thereof, through the switch connecting the first and second terminals.

4,457,384

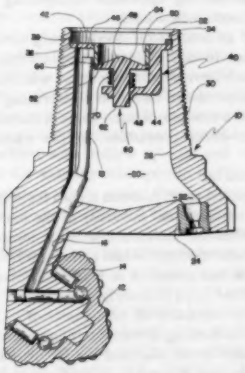
WATER SEPARATOR AND BACKFLOW VALVE

Larry H. Layton, Newkirk, Okla., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Aug. 23, 1982, Ser. No. 410,207

Int. Cl.³ E21B *10/18, 41/00*

U.S. Cl. 175—318 **7 Claims**



1. A gas circulation roller cone rock bit having a body with a lower cutting end, at least one cutter cone rotatably mounted on a bearing extending from the body, a chamber formed within an upper portion of the body, at least one flushing air

passageway from the lower portion of the chamber for emitting gas from the chamber into a borehole, and an upper pin end on the body for connecting the rock bit to a drill pipe and forming an entrance to the chamber comprising:

a check valve between the entrance and the chamber for admitting gas from such a drill pipe into the chamber and inhibiting flow of gas from the chamber toward the entrance, and

a conduit having an upper open end within an upper portion of the chamber above the elevation of the check valve and an open lower end adjacent the bearing for delivering gas from the chamber to such a bearing, said upper open end of the conduit is adjacent a chamber wall and the check valve is centrally located above the chamber.

4,457,385

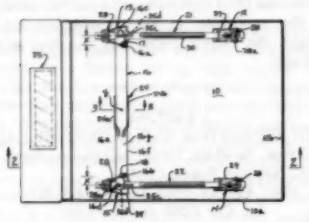
PLATFORM SCALE WITH BENDABLE LOAD SENSING BEAM

Mike A. Provi, Rockford, Ill., assignor to The Brearly Company, Rockford, Ill.

Filed Oct. 23, 1975, Ser. No. 625,193

Int. Cl.³ G01G 3/14, 21/08

U.S. Cl. 177—211 **4 Claims**



1. Load-measuring apparatus comprising a load-support platform for receiving a load,

a plurality of mechanical load-sensing devices operatively connected to said platform at points spaced on the platform, each device including a part which transmits a force in a predetermined direction with sensing by the device of a load, the amount of such force transmitted by the part being in direct proportion to the amount of the load sensed,

an elongated bar,

a pair of spaced-apart fulcrum means for supporting said bar located adjacent and inwardly of the bar's opposite ends,

electromechanical deflection-sensing means mounted on said bar intermediate its said ends for following bending of the bar in one direction in a selected plane, and for producing from such following an electrical response which is directly indicative of the amount of such bending, and

for each load-sensing device, coupling means coupling said part in said device and said bar for producing bending in the bar in said plane and in said one direction in direct proportion to the amount of force transmitted by said part in said predetermined direction with sensing of a load by the device, said coupling means including links connecting with the opposite ends of said bar outwardly of said fulcrum means.

4,457,386

TEMPERATURE-CORRECTED WEIGHING APPARATUS HAVING ELECTROMAGNETIC LOAD COMPENSATION MEANS

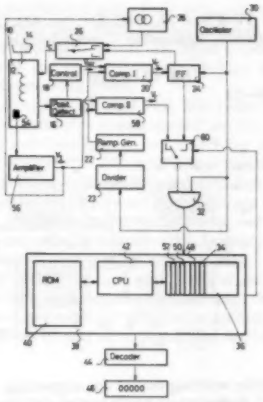
Oskar Schett, and Richard Leemann, both of Uster, Switzerland, assignors to Mettler Instruments AG, Greifensee, Switzerland

Filed Sep. 23, 1982, Ser. No. 421,779

Claims priority, application Switzerland, Feb. 10, 1982, 808/82

Int. Cl.³ G01G 7/00, 3/14

U.S. Cl. 177—212 **5 Claims**



1. In a weighing apparatus of the electromagnetic load compensation type including

(a) a stationary member (10) having means defining a stationary permanent magnetic field;

(b) a movable load carrier (14) normally having an initial no-load position relative to said stationary member;

(c) compensation coil means (12) connected with said load carrier for movement in said magnetic field;

(d) means (16, 18) for generating an analog weight-responsive signal (V_w) as a function of the displacement of the movable load carrier from its initial no-load position relative to said stationary member;

(e) first comparison means (20) for comparing said weight-responsive signal with a sawtooth waveform signal to produce a compensation output signal (V_c) including a plurality of pulses the lengths of which are a function of the magnitude of said weight-responsive signal;

(f) means (26, 28) operable by said output signal for supplying compensation current to said coil means for periods of time corresponding with the lengths of said output signal pulses; and

(g) load indication means for indicating the magnitude of the load applied to the load carrier, including a source of counting pulses (30), a counter (34), and means (24, 60, 32) for supplying a first train of said counting pulses to said counter for periods of times corresponding with the lengths of said compensation output signal pulses;

the improvement which comprises:

(h) means (48) for storing the weight-responsive count of said counter means;

(i) temperature compensation means for supplying temperature-responsive pulses to a counter means as a function of variations in the temperature of the weighing system, said temperature compensation means including

(1) means including a temperature sensor (54) mounted on said stationary member for producing a temperature-responsive analog signal (V_t); and

(2) means for supplying a second train of counting pulses the number of which corresponds with the

magnitude of said temperature-responsive analog signal; and

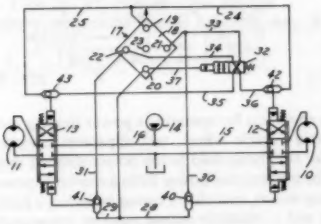
(j) means (42) for processing the weight pulse count with the temperature-responsive pulse count to produce a temperature-compensated weight result.

4,457,387

HYDRAULIC STEERING SYSTEM FOR FULL-TRACK VEHICLES

Henry D. Taylor, Pontiac, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed May 19, 1980, Ser. No. 151,305
Int. Cl.³ B62D *11/04*
U.S. Cl. 180—6.48 **9 Claims**



1. A hydraulic steering system for full-tracked vehicles comprising

first and second reversible hydraulic motors adapted to drive a pair of respective vehicle tracks,

a first and second bi-directional valve for said first and second hydraulic motors, respectively,

first, second, third and fourth manually operable valve control units adapted to be connected to a source of pilot pressure, each said valve control unit being operable to produce an output proportional to manual displacement thereof,

said first valve control unit being connected to said bi-directional valves such that operation of said first valve control unit functions to actuate said bi-directional valves to a first position to operate both said hydraulic motors in a first driving direction,

said second valve control unit being connected to said first and second bi-directional valves such that operation of said second valve control unit functions to actuate said bi-directional valves to a second position to operate said hydraulic motors in a second driving direction,

said third valve control unit being connected to said first bi-directional valve which controls said first hydraulic motor such that operation of said third valve control unit functions to actuate said first bi-directional valve to operate said first hydraulic motor in a second driving direction,

said fourth valve control unit being connected to said second bi-directional valve which controls said second hydraulic motor such that operation of said fourth valve control unit functions to actuate said second bi-directional valve to control said second hydraulic motor in a second driving direction,

said third valve control unit being also connected to permit flow when operated to said second bi-directional valve to tend to actuate said second bi-directional valve in a direction to operate the second hydraulic motor in said first driving direction,

said fourth valve control unit being also connected to permit flow when operated to said first bi-directional valve to tend to actuate said first bi-directional valve in a direction to operate its first hydraulic motor in said first direction,

valve means associated with each end of each bi-directional valve and operable to sense the greater of the two pilot pressures and permit the greater to be applied to the bi-directional unit when two valve control units are operated simultaneously and tend to direct two pilot pressures toward the same end of a bi-directional valve unit,

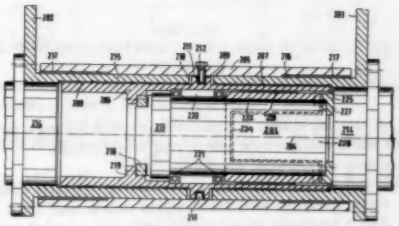
a pilot operated directional valve connected to said second valve control unit and operable upon simultaneous displacement of said second valve control unit and said third control unit to actuate said first bi-directional valve so that said first hydraulic motor is not operated, said directional valve being also connected to said fourth valve control unit such that upon simultaneous displacement of said second valve control unit and said fourth control unit, said second hydraulic motor is not operated.

4,457,388

CHASSIS FOR A VEHICLE WITH VARIABLE UNDERCARRIAGE GEOMETRY

Wolfgang Koehler, Karlsruhe; Hans-Joachim Blocher, Metzingen, and Eberhard Weiss, Pfullingen, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 14, 1982, Ser. No. 387,970
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1981, 3146662
Int. Cl.³ B62D *55/00*
U.S. Cl. 180—9.48 **5 Claims**



1. A chassis for a vehicle with variable undercarriage geometry comprising: elongated undercarriage support beam supporting a vehicle body structure, vehicle propulsion means associated with said undercarriage support beams, a cross-frame member forming part of said vehicle body structure and including one of said undercarriage support beams arranged at each end thereof, a tubular structure comprising a guide tube with two slide tube sections axially movably supported within said guide tube, said slide tube sections projecting from opposite ends of said guide tube and carrying said undercarriage support beams, a hollow spindle extending within said cross-frame member and having end sections threaded at the outside in the opposite sense and engaged with corresponding threads on the inner surface of said slide tube sections and an operating motor disposed within said hollow spindle and operatively connected thereto for rotating said spindle to thereby move said slide tube sections axially away from, or toward, each other for changing the undercarriage track width.

5. A chassis for a vehicle with variable undercarriage geometry comprising: elongated undercarriage support beams supporting a vehicle body structure, vehicle propulsion means associated with said undercarriage support beams, a cross-frame member forming part of said vehicle body structure and comprising a guide tube with two slide tube sections axially movably supported within said guide tube, said slide tube sections projecting from opposite ends of said guide tube and carrying said undercarriage support beams, an an operating motor mounted on the outside of said guide tube with its axis normal to the axis of said guide tube, said operating motor having an output shaft extending into said guide tube and being provided with pivot arms which are linked to said slide tube sections for axially moving said slide tube sections and the

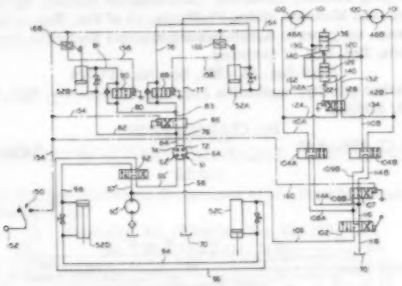
associated undercarriage support beams toward, and away from, one another.

4,457,389

STEERING SYSTEM FOR GANTRY-TYPE CRANE

Richard Voelz, Butler, Wis., assignor to Renner Manufacturing Company, Milwaukee, Wis.

Filed Nov. 18, 1981, Ser. No. 322,475
Int. Cl.³ B62D *5/08*
U.S. Cl. 180—140 **7 Claims**



1. A steering system for gantry-type crane having a pair of front wheel means and a pair of rear wheel means,

a source of hydraulic pressure,

first and second hydraulic wheel turning cylinders coupled respectively to said front wheel means and third and fourth hydraulic wheel turning cylinders coupled respectively to said rear wheel means, said hydraulic wheel turning cylinders being operable when pressurized to turn its respective wheel means through at least a right angle,

Hydraulic control means including a first control valve means coupled to said first and second hydraulic wheel turning cylinders and to said source of hydraulic pressure and having a two-wheel steering mode for connecting said first and second hydraulic wheel turning cylinders to said source of hydraulic pressure and in a first hydraulic circuit relation with each other for two-wheel steering so that said cylinders turn their respective wheels through different turning angles, said hydraulic control means also having a four-wheel mode for connecting said first and second hydraulic wheel turning cylinders to said source of hydraulic pressure and in a second hydraulic circuit relation with each other for turning said front wheels means through a 90 degree angle,

a second control valve means having a two-wheel mode for isolating said third and fourth hydraulic wheel turning cylinders from the source of hydraulic pressure and a four-wheel steering mode for connecting said third and fourth hydraulic wheel turning cylinders to said source of pressure for turning said rear wheel means through a 90 degree angle,

actuating means for selectively placing said first and second control valve means in their two or four-wheel steering modes,

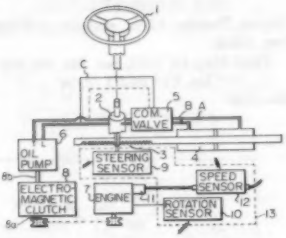
and steering means disposed between said first control valve means and said source of hydraulic pressure for regulating the flow of hydraulic fluid to said first and second hydraulic wheel turning cylinders to control the turning angle of said front wheel means during two-wheel steering.

4,457,390

POWER STEERING DEVICE

Michio Abe, and Naoyuki Maeda, both of Aichi, Japan, assignors to Tokai TRW & Co. Ltd., Aichi, Japan

Filed Jun. 16, 1982, Ser. No. 388,920
Int. Cl.³ B62D *5/06*
U.S. Cl. 180—142 **7 Claims**



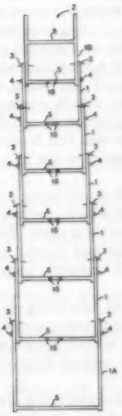
1. An apparatus for operating a power steering motor to turn a steerable vehicle wheel, said apparatus comprising pump means for supplying fluid to the power steering motor, clutch means for transmitting power from a source of power to drive said pump means, said clutch means including a rotatable input member and a rotatable output member connected with said pump means, and control means responsive to vehicle speed and operatively associated with said clutch means for decreasing the rate of rotation of said output member relative to the rate of rotation of said input member as vehicle speed increases.

4,457,391

FOLD-UP LADDER

D. Salvador Alimbau Marques, Barcelona, Spain, assignor to Aadral Corporation, Williamsville, N.Y.

Filed Jan. 21, 1982, Ser. No. 341,830
Claims priority, application Spain, Jan. 28, 1981, 256.261[U]; Apr. 15, 1981, 288.208[U]
Int. Cl.³ E06C *1/383*
U.S. Cl. 182—164 **15 Claims**



1. A portable folding lean to ladder comprising a plurality of U-shaped modules comprising a rung and two vertical portions, said modules movably connected to each other, and when opened becoming progressively narrower as they approach the top of said ladder, when folded said narrower

modules fitting inside of the next wider modules, said modules except for said widest base module comprising in their lower portions a complete module locking means and a module hinge means, said locking means fixing said modules in a rigid manner when said ladder is extended and open, said locking means integral with said modules and comprising latches adapted to movably fit into and mate with an aperture located in the upper sections of said vertical portions of said modules, and tapered grooved guide portions immediately adjacent said apertures to facilitate easy entrance of said latch into said aperture.

4,457,392

AUTOMATIC SPEED CONTROL SYSTEMS

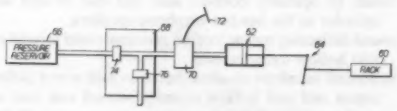
Kenneth B. Caldwell, Rugby, and Kenneth W. Beddow, Coventry, both of England, assignors to Associated Engineering Limited, Rugby, England

Filed Jul. 21, 1981, Ser. No. 285,534

Claims priority, application United Kingdom, Aug. 8, 1980, 8025881

Int. Cl.³ B60K *31/00*

U.S. Cl. 180—176 **3 Claims**



1. An automatic vehicle speed control system comprising

means responsive to desired and actual vehicle speeds to produce a control signal dependent on any speed error,

a member whose movement adjusts the power of the engine of the vehicle,

a pneumatic pressure line,

first, driver-operable, pneumatic-pressure-adjusting valve means in the said pressure line,

a piston-cylinder assembly having the interior of the cylinder connected to the said pressure line downstream of the said valve means,

connecting means mechanically interconnecting the piston-cylinder assembly with the said member whereby to enable the driver to adjust the engine power by varying the pressure in the piston-cylinder assembly by means of the first valve means, and

second pressure-adjusting valve means in the said pressure line and upstream of the first valve means and responsive to the said control signal and operative to vary the engine power in dependence on the said control signal,

whereby setting of the first valve means to the minimum engine power setting shuts the said pressure line and substantially prevents the second valve means from affecting the pressure in the piston-cylinder assembly.

4,457,393

SUSPENSION DEVICE FOR MOTORCYCLE

Hirohide Tamaki, Hamamatsu, and Manabu Suzuki, Shizuoka, both of Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

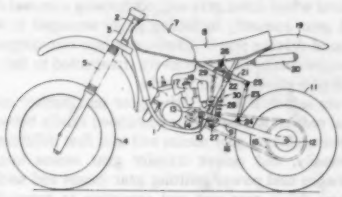
Continuation of Ser. No. 195,121, Oct. 8, 1980, abandoned. This application Apr. 7, 1983, Ser. No. 482,921

Claims priority, application Japan, Oct. 16, 1979, 54-133303

Int. Cl.³ B62K *25/04*

U.S. Cl. 180—227 **9 Claims**

1. In a suspension device for motorcycles, wherein a pair of swing arm portions positioned respectively at each side of a rear wheel are pivotally secured at their front ends to rear low-portion of the vehicle frame by a laterally horizontal shaft, said rear wheel being rotatively supported by rear ends of said swing arm portions about a horizontal shaft, a link lever extending frontward and rearward is pivotally secured at intermediate portion thereof to rear upper-portion of said frame by laterally horizontal shaft, one end of the link lever is pivotally secured to upper end of at least one rod member which is pivotally connected, at its lower end, to said swing arm portions and upper end of compression type spring means is pivotally secured to other end of said link lever; an improvement wherein lower end of at least one rod member is connected at an intermediate part of the swing arm portions in its longitudi-



nal direction, lower end of said spring means is pivotally connected directly to a position on the swing arm portions between front end of the swing arm portions and the connecting point at which the lower end of said rod member is connected to the swing arm portions and said compression type spring means have a single spring member and a single shock absorber member.

4,457,394

FOUR-WHEEL DRIVE SYSTEM FOR AUTOMOTIVE VEHICLE

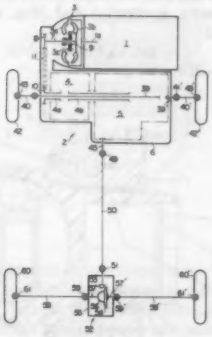
Kunihiko Suzuki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 21, 1982, Ser. No. 380,701

Claims priority, application Japan, Jul. 22, 1981, 56-114889

Int. Cl.³ B60K *17/34*

U.S. Cl. 180—247 **28 Claims**



1. A four-wheel drive system for a vehicle having at least two pairs of road wheels consisting of a pair of front road wheels and a pair of rear road wheels, comprising

a power unit having an output shaft rotatable about an axis in a lateral direction of the vehicle;

a power transmission gear unit including transmission input and output shafts each having an axis of rotation substantially parallel with the axis of rotation of the output shaft of the power unit, and gears connected to the transmission input and output shafts and arranged to be capable of selectively producing a plurality of ratios between the speeds of rotation of the transmission input and output shaft;

a first wheel drive gear unit comprising power splitting gear means operative to split driving power from said transmission output shaft into first and second driving power

components, and a first differential gear assembly including gears arranged to split the first driving power component into two output power components to be respectively transmitted to one of said two pairs of road wheels, said power splitting gear means and the first differential gear assembly being positioned substantially in alignment with said transmission output shaft in a lateral direction of the vehicle; and

a second wheel drive gear unit comprising a second differential gear assembly including gears arranged to split the second driving power component into two output power components to be respectively transmitted to the other of said two pairs of road wheels;

wherein said first wheel drive gear unit further comprises final reduction gear means positioned axially between said power splitting gear means and said first differential gear assembly, and power transfer gear means intervening between said power splitting gear means and said second wheel drive gear unit and operative to transmit therethrough said second driving power component to said second differential gear assembly,

said power splitting gear means comprising a driving power transfer bevel gear rotatable about an axis substantially aligned with the axis of rotation of the transmission output shaft, said power transfer gear means comprising a driven power transfer bevel gear which is rotatable about an axis in a fore-and-aft direction of the vehicle body and which is held in mesh with the driving power transfer bevel gear.

4,457,395

BEARING ARRANGEMENT FOR THE DRIVING WHEEL OF A VEHICLE

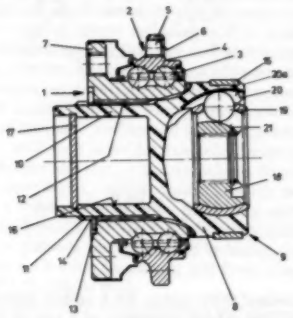
Horst M. Ernst, Eltingshausen; Manfred Brandenstein, Eussenheim, and Lothar Walter, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jun. 30, 1982, Ser. No. 393,731

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1981, 3126192

Int. Cl.³ B60K *17/30*

U.S. Cl. 180—254 **15 Claims**



1. In a bearing arrangement for the driving wheel of a vehicle, consisting of a rolling bearing having an inner and an outer ring, said outer ring being provided with a flange for affixing the bearing arrangement to a vehicle frame and said inner ring having a bore, and further including a shaft coupling having a drive part and a driven part, the improvement wherein said driven part of said shaft coupling is of a fiber strengthened plastic material and is connected to said inner ring of the wheel bearing with an interference fit, and said inner ring of said rolling bearing and said driven part of the shaft coupling have intermeshing projections and recesses providing said interference fit connection of the two parts in the circumferential direction.

4,457,396

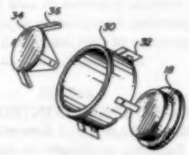
SOUND DEFLECTOR FOR HEADSET EAR PHONES

David L. James, 5250 E. 16th. St., Tucson, Ariz. 85711

Filed Sep. 24, 1982, Ser. No. 423,015

Int. Cl.³ H04R *25/00*

U.S. Cl. 181—136 **10 Claims**



1. A device for deflecting sound from passage directly into a user's ear canal, said sound deflection device for attachment to a user's headset earphone speaker case comprising:

a hollow cylinder having a first and second end;

means to operably connect said first end of said hollow cylinder to the headset earphone speakers;

sound deflecting means located proximate said second end of said hollow cylinder; and

structural members attached between said sound deflecting means and said hollow cylinder second end, said structural members defining openings interposed said hollow cylinder second end and said sound deflecting means to permit passage of sound waves from said hollow cylinder to the folds of skin on the outer ear and then to the user's ear canal.

4,457,397

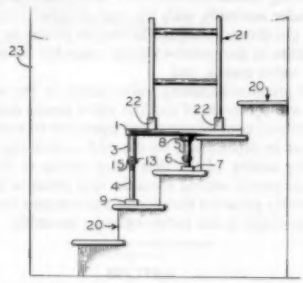
PLATFORM FOR STAIRS

John J. Scala, 1968 Somerset, Wheaton, Ill. 60187

Filed Nov. 10, 1981, Ser. No. 320,054

Int. Cl.³ E04G *1/36*; E06C *7/44*

U.S. Cl. 182—116 **1 Claim**



1. A platform for stairs comprising:

a. a platform;

b. a frame integrally secured to the edges of the platform;

c. a first plurality of sleeves extending transversely from the bottom portion of the frame secured to a first edge of the platform;

d. means to attach the first plurality of sleeves to the frame of the platform near the first edge;

e. a first plurality of lower legs slid inside the first plurality of sleeves and resting on a first step or floor;

f. means to adjustably and rigidly secure the first plurality of legs to the first plurality of sleeves;

g. a second plurality of sleeves extending transversely from the middle portion of the platform and supporting the middle portion of the platform;

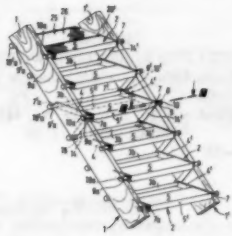
h. a second plurality of lower legs slid inside the first pluarlity of sleeves and resting on a second step one step higher than the first step or the floor;
i. means to attach the second plurality of sleeves to the middle portion of the platform;
j. means to secure the second plurality of legs adjustably and rigidly to the second plurality of sleeves;
k. a bottom portion of the platform and frame including the second end of the platform opposite the first end of the platform supported by resting horizontally against a third stair step two steps higher on the stairs than the first stair step or floor.

4,457,398

ELEMENTS TO BE ASSEMBLED TO FORM TEMPORARY STAIR

Gilbert Loix, rue Bourgogne 5, Jupreile, Belgium

Filed Jan. 20, 1982, Ser. No. 341,020
Claims priority, application Belgium, Jan. 22, 1981, 887181
Int. Cl.³ E04G *27/00*; E06C *1/00, 7/08*
U.S. Cl. 182—151 **7 Claims**



1. A temporary stair, comprising a pair of planks of substantially identical cross-section, a plurality of steps substantially identical with one another, each step comprising at least two tubes extending between and connected to said planks, a plate engaging said tubes and forming a non-slip surface of the step proper, a plurality of check plates, the tubes being formed with reduced diameter ends, the check plates being formed with openings, and the reduced diameter ends being slid into said openings, two of said tubes being separated by a distance exceeding the width of the planks, a plurality of bushings each having a length exceeding the thickness of a plank, the bushings being held on the tubes, a plurality of bearing members respectively mounted on said bushings, each bearing member having a length slightly greater than the thickness of the planks, a plurality of flats respectively pivotally mounted at one end on one of said bushings and formed at the other end with a hook-shaped portion engageable with the bushing of the step placed next below, in such a manner that each step rests, at each side at the front, on a bearing member, another bearing member being pulled against the lower edge of each plank by a flat connected to the step placed next above.

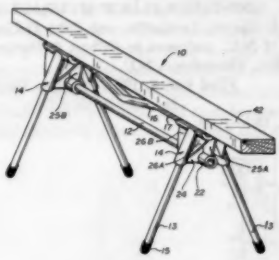
4,457,399

WORK SUPPORT UNIT

John H. Breisch, Lakewood, Ohio, assignor to Patterson & Patterson, Inc., Cleveland, Ohio

Filed Feb. 28, 1983, Ser. No. 470,173
Int. Cl.³ B27B *21/00*; A47B *37/00*; F16M *11/00*
U.S. Cl. 182—185 **11 Claims**

1. A bracket for a work supporting unit comprising a monolithic body for coupling a plurality of horizontal cross bars and a pair of legs and adapted to cooperate with a like bracket at the opposite end of said bars, the bracket including two upper recesses each individually adapted to receive one of a pair of horizontal upper cross bars in spaced parallel coplanar relation, a lower recess adapted to receive a third cross bar, the lower recesses being parallel to the upper recess and centered on a vertical plane midway between said upper recesses, and a pair of leg recesses, said leg recesses being in an imaginary plane slightly canted outwardly in a downward direction from



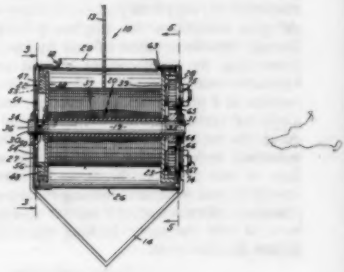
a vertical plane, the leg recesses diverging from one another in a downward direction, and means rigidly interconnecting all of said cross bar and leg recesses.

4,457,400

EMERGENCY DESCENT DEVICE

John M. Donaldson, Grosse Pointe Park; Donn E. Vidosh, Bloomfield Hills; Lars G. Karlson, Farmington Hills, all of Mich., and Dennis A. Thomas, Las Vegas, Nev., assignors to Gernaimo Industries, Ltd., Birmingham, Mich.

Filed Sep. 16, 1982, Ser. No. 418,913
Int. Cl.³ A62B *1/10*
U.S. Cl. 182—234 **19 Claims**



1. An emergency descent device comprising:
a housing having an opening through one side;
a shaft extending through the housing being journalled for rotation in openings formed in opposite ends of the housing;
a spool journalled for rotation relative to the shaft and the housing, said spool being located inside the housing;
a cable being wound about said spool, and being adapted to be pulled from said spool through the opening in the housing;
said cable having a first end secured to the spool and a second end disposed outside said housing;
a brake system connected to a first end of said shaft to engage a first end of said spool for applying a frictional force to resist rotation of the spool said brake system including a centrifugally actuated means connected to the shaft for increasing the frictional force applied to resist rotation of said spool; and
means attached to a second end of said shaft and a second end of said spool for controlling the rate of rotation of the shaft to control the amount of frictional force applied by said brake system and produce a balanced braking action

and a substantially constant descent velocity for different loads.

4,457,401

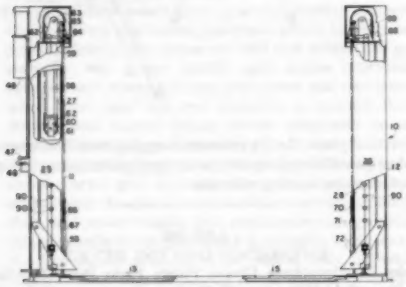
ABOVE-THE-FLOOR HYDRAULIC LIFT

James J. Taylor, Lewisville, and John DiCinque, Burlington, both of N.C., assignors to Gilbert & Barker Manufacturing Co., Inc., Greensboro, N.C.

Filed Apr. 9, 1982, Ser. No. 366,845

Int. Cl.³ B66F 7/04

U.S. Cl. 187—8.49 **6 Claims**



1. An above-the-floor hydraulic lift comprising: a pair of vertical pipe stanchions having vertically spaced locking lugs thereon spaced laterally from each other to accommodate a vehicle therebetween, a vertically displaceable bolster mounted on each pipe stanchion, each of said bolsters having a pair of pivotally supported cantilever-extending lift arms for cooperatively supporting a vehicle thereon, hydraulic means in sid pipe stanchions for displacing said bolsters in unison through synchronization of said hydraulic means, means for controlling the displacement of said bolsters through said hydraulic means, means for releasably locking said bolsters in position at a predetermined elevation, said means including in a selected vertical position to said vertical pipe stanchions, said automatic locking means including a cable for releasing said automatic locking means from engagement with said locking lugs on said pipe stanchions, and means for overriding the release of said automatic locking means whereby vertical displacement obstruction of a bolster will permit overriding release of said automatic locking means and prevent further bolster displacement.

4,457,402

WHEELCHAIR LIFT

Joseph A. Del Vecchio, East Providence, R.I.; Kenneth L. Hunnibell, Rehoboth, Mass.; Christopher G. Ladewig, Providence, and Mark S. Harrison, Portsmouth, both of R.I., assignors to Lipstep Design Group Corp., East Providence, R.I.

Filed Apr. 27, 1982, Ser. No. 372,292

Int. Cl.³ B66B 9/06

U.S. Cl. 187—12 **11 Claims**

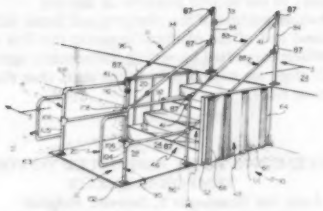
1. A combination elevator platform-stairway apparatus which is operable to transport persons, articles and the like between a lower supporting surface and an upper supporting surface comprising:

a. a stair member having an upper surface thereon;

b. a platform having an upper surface thereon adjacent to said stair member;

c. means for moving said platform between a first position wherein the upper surface thereof is substantially coplanar with said lower supporting surface and a second position wherein the upper surface thereof is substantially coplanar with said upper supporting surface;

d. means mounting said stair member so that it is vertically slidable between a lower position thereof wherein it forms a step between said platform surface and said upper supporting surface when said platform is in said first position and an upper position thereof wherein the upper surface thereof is substantially coplanar with said upper supporting surface; and



e. means for slidably moving said stair member vertically in said stair member mounting means so that said stair member is moved to the upper position thereof when said platform is moved to said second position.

4,457,403

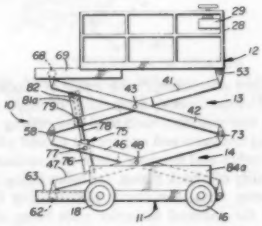
SELF-PROPELLED ELEVATING WORK PLATFORM

Michael D. Ream, Lafayette, Calif., assignor to Up-Right, Inc., Berkeley, Calif.

Filed Sep. 16, 1982, Ser. No. 418,711

Int. Cl.³ B66B 11/04

U.S. Cl. 187—18 **10 Claims**



1. An elevatable work platform apparatus comprising:

a horizontal frame,

a generally rectangular and horizontal work platform above said frame member, said work platform having a given length and width,

upper and lower scissors sets, each set having an elongated power arm and an elongated stabilizer member, said power arm and stabilizer member of each set being pivotably connected to each other, said power arms each being longer than the length of said work platform.

means pivotally connecting one end of the lower power arm to one end of said frame,

means pivotally connecting one end of the upper power arm to one end of said work platform,

means pivotally connecting the other ends of said lower and upper power arms together,

means movably interengaging one end of the lower stabilizer member with the other end of said frame,

means movably interengaging one end of the upper stabilizer member with the other end of said work platform,

means pivotally connecting the other ends of said lower and upper stabilizer members together,

a generally vertical ram having a cylinder and piston rod portions,

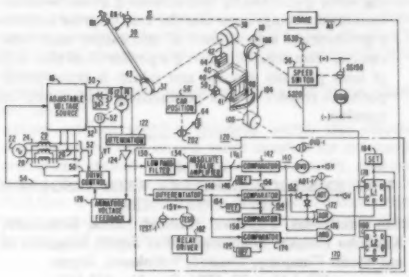
means pivotally connecting said cylinder and piston rod portions to said lower and upper power arms, with part of

said ram extending upwardly from said upper power arm, and with the distance from the pivotal connection of said upper power arm and said work platform to the pivotal connection of said upper power arm and the ram portion connected thereto being greater than the distance from the pivotal connection of said upper power arm and said work platform to the other end of said work platform.

4,457,404
ELEVATOR SYSTEM

Alan L. Husson, Hackettstown, and Vladimir Uberek, Parsippany, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 26, 1982, Ser. No. 382,438
Int. Cl.³ B66B *1/30*
U.S. Cl. 187—29 R **13 Claims**



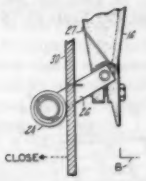
1. An elevator system comprising:
an elevator car having door means operable between open and closed positions,
motive means for said elevator car, including an adjustable voltage source and a drive motor having an armature circuit,
overvoltage means monitoring the voltage in the armature circuit of said drive motor, and for providing a first true signal when the voltage exceeds a predetermined magnitude,
overacceleration means monitoring the rate-of-change of the voltage in the armature circuit of said drive motor, and for providing a second true signal when the rate-of-change exceeds a predetermined magnitude, at least when the voltage is increasing,
test means for testing the operability of said overvoltage means and said overacceleration means during each run of the elevator car, and for providing a third true signal when the tests indicate a malfunction,
and protective means responsive to said first, second and third signals, said protective means initiating an emergency stop of said elevator car when said first signal is true when the elevator car is in the process of landing, initiating an emergency stop of said elevator car when said second signal is true, and for preventing the elevator car from starting another run when said third signal is true.

4,457,405
CAR AND HOISTWAY DOOR COUPLING APPARATUS

Calvin E. Johns, Tampa, Fla., assignor to Otis Elevator Company, Farmington, Conn.

Filed May 18, 1981, Ser. No. 264,889
Int. Cl.³ B66B *13/00*
U.S. Cl. 187—52 LC **2 Claims**

1. A car and hoistway door coupling apparatus for an elevator having an elevator car with a sliding door for closing an opening to said car; means for moving said car door across said opening; a hoistway for said car with a hoistway sliding door for closing an opening to said hoistway; an interlock mechanism including a locking device mounted on said hoistway door and operable to lock said hoistway door in a closed position across its associated opening, said car and hoistway door coupling apparatus comprising, a vertical vane on the car door, a first roller on the hoistway door and a second roller on the interlock device, said rollers disposed to receive the vane therebetween, to couple said hoistway door to said car door during movement of said car door across its associated opening in both the opening and closing directions, so that said hoistway door moves across its associated opening in conjunction with the movement of said car door across its associated opening, and to decouple said car door and said hoistway door during the closing operation of said doors when said hoistway

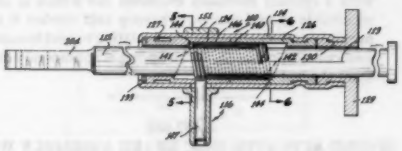


door reaches a predetermined distance from said closed position, characterized in that:
said second roller is swingably attached to said interlock device for swinging movement relative to said locking device about a pivot axis that is normal to the plane of said car door so as to be movable about the pivot axis between positions that are at different distances from said first roller along the direction in which said car door moves, and at one of said positions said second roller is restrained from further pivotal motion by said interlock device in the direction in which said vane moves as said car door opens, by which said vane is mechanically connected to said hoistway door for opening said hoistway.

4,457,406
IMPROVED FRICTION LOCK

Clyde R. Porter, Los Angeles, Calif., assignor to P. L. Porter Company, Woodland Hills, Calif.

Continuation-in-part of Ser. No. 157,458, Jun. 6, 1980, abandoned. This application May 28, 1981, Ser. No. 267,852
Int. Cl.³ B65H *59/10*
U.S. Cl. 188—67 **9 Claims**



1. As an article of manufacture, an infinitely positionable mechanical friction lock comprising:
a housing having a rod positioned therein for axial movement with respect thereto;
first and second substantially identical interchangeable bushings each including an inner annular inclined cam surface and a cam stop, one bushing being fixed to said housing and the other bushing being rotatable relative to said housing;
a coil spring positioned on said rod and located within said spring space between said inclined cam surfaces and normally operative to grip said rod to prevent movement thereof relative to said housing;
said coil spring including ends providing a flat surface on the

radius of the center line of said spring for abutting engagement with the cam stop of said bushings; and,

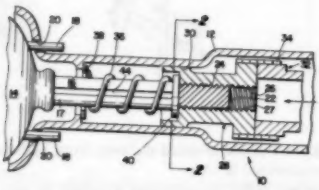
actuator means to effect rotation of said rotatable bushing whereby said coil spring is released from said rod to permit movement of the latter relative to said housing, said actuator means being engageable with said rotatable bushing through an opening defined in said housing.

4,457,407

AUTOMATIC SLACK ADJUSTER

Frederick R. Monick, Kalamazoo, and Stanley J. Muster, Marshall, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 11, 1982, Ser. No. 357,243
Int. Cl.³ F16D 65/56
U.S. Cl. 188—71.9 **2 Claims**



1. An improved disc brake clearance sensing slack adjuster for maintaining a predetermined running clearance between the brake friction pads and the disc, said adjuster comprising a housing, a disc rotatable relative to the housing, an elongated rod axially movable in the housing, a nut member axially movable in the housing, said rod member threadably engaged at one end thereof to said nut member, a friction pad engagement means fixed to the other end of said rod, actuating means to selectively axially move said nut member and rod towards said disc, automatic adjustment means to rotate said nut member relative to said housing in response to sensing greater than predetermined running clearance, means to rotationally fix said rod member relative to said housing and a coil compression return spring surrounding said rod member and acting on said nut member to resiliently urge said nut member away axially from said disc, the improvement comprising,

said rod provided with an axially extending groove on the outer surface thereof and a washer spring seat seating one end of said compression spring and axially engageable with said nut member, said washer spring seat provided with a radially inwardly extended tab which is slidably receivable in said groove whereby said washer is axially movable and rotationally fixed relative to said housing and said coil compression return spring is rotationally isolated from the nut member.

4,457,408

SPRING ACTUATED DISC BRAKE ASSEMBLY WITH CAM STRUCTURE FOR FORCE MULTIPLICATION EFFECT

William W. Montalvo, III, 200 Riverside Industrial Pkwy., Portland, Me. 04103

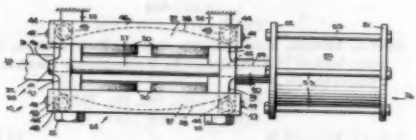
Filed Feb. 16, 1982, Ser. No. 349,055
Int. Cl.³ F16D 55/18
U.S. Cl. 188—72.2 **38 Claims**

1. A disc brake mechanism for selectively frictionally coupling at least one rotatable disc member with a relatively non-rotatable body member comprising:

a caliper means slidably mounted on said non-rotatably body member for to-and-fro movement in a direction generally parallel to the axis of rotation of said at least one rotatable disc member, said caliper means comprising a pair of like caliper members in spaced generally parallel relationship, each of said caliper members having an inner friction surface for frictional engagement with a respective opposed surface of said at least one rotatable disc member;

means for actuating said disc brake mechanism; and

cam means for transferring axial movement of said actuating means to a movement of said caliper members in a direction generally parallel to the axis of rotation of said at least one rotatable disc member and for intensifying the actuating force generated by said actuating means wherein said cam means comprises a circular cam seqment mounted on a perimetrical side of each of said caliper members, said circular cam segment having a perimetrical side which is at least partially arcuate and which is transversely disposed in respect of said perimetrical side of said caliper member.

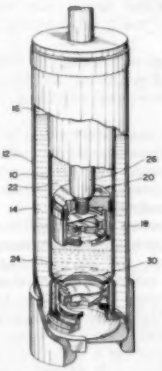


4,457,409

VORTEX SHOCK ABSORBER WITH ABSORBING FORCE RELIEF MEANS

Naoto Fukushima, Fujisawa; Kazuroh Iwata, Kamakura, and Kunihiko Hidaka, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 27, 1981, Ser. No. 325,417
Claims priority, application Japan, Nov. 28, 1980, 55-168941
Int. Cl.³ F16F 9/34
U.S. Cl. 188—282 **35 Claims**



1. A vortex flow shock absorber comprising:

an outer hollow cylindrical tube;

an inner hollow cylindrical tube coaxially disposed within said outer tube to define therebetween an annular chamber;

a piston movably disposed within said inner tube to define first upper and second lower chambers within said inner tube, said piston being attached to a lower end of a slidable piston rod and having a first circular bore opening downwardly on a surface opposing said second chamber;

a first valve member movably disposed within said circular bore and defining therein a first vortex chamber in which vortex fluid flow is produced, said valve member having a vortex passage extending through a periphery thereof and opening into the first vortex chamber in a direction normal to a radius thereof, said valve member further having

a central opening formed substantially at a center of a bottom thereof;

a first bypass passage bypassing said first vortex chamber;

a first resilient member disposed within said circular bore and above said first valve member to urge said first valve member toward an open end of said first circular bore, said first resilient member being compressed in response to fluid flow in a direction from said second chamber to said first chamber to permit the first valve member to move upwards to open said first bypass passage;

a bottom fitting attached to a lower end of said inner tube and having therein a circular chamber, said circular chamber establishing communication between said second chamber and said annular chamber;

a second valve member disposed within said circular chamber and defining therein a second vortex chamber for producing vortex fluid flow, said second vortex chamber communicating with said circular chamber via a second vortex passage and a central opening, said second vortex passage permitting fluid flow from said second chamber to said second vortex chamber to produce vortex fluid flow therein;

a second bypass passage bypassing said second vortex chamber; and

a second resilient member disposed within said circular chamber above said second valve member for constantly urging said second valve member downwardly, said second resilient member being compressed in response to fluid flow from said annular chamber to said second chamber to permit the second valve member to move upwards to open said second bypass passage.

4,457,410

LOCK-UP CONTROL SYSTEM FOR A LOCK-UP TYPE AUTOMATIC TRANSMISSION OF AN AUTOMOTIVE VEHICLE HAVING AN ENGINE

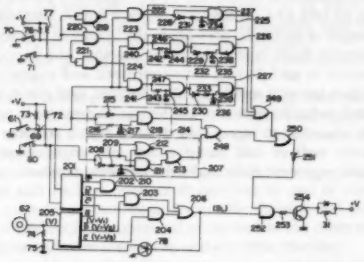
Masaaki Saga, Yokohama; Yoshiro Morimoto, Yokosuka; Hideo Hamada, Yokosuka; Masaaki Futagi, Yokosuka, and Tadashi Suzuki, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 8, 1981, Ser. No. 271,125

Claims priority, application Japan, Jun. 10, 1980, 55-77085

Int. Cl.³ B60K *41/28*

U.S. Cl. 192—0.052 **3 Claims**



1. A lock-up control system for a lock-up type automatic transmission of an automotive vehicle having an engine, said transmission including a hydraulic control system for operating a plurality of hydraulic devices operable to be selectively actuated to establish one of a plurality of gear ratios, and a torque converter with a lock-up clutch, the torque converter being shiftable into a lock-up state wherein said lock-up clutch is engaged or a torque converter state wherein said lock-up clutch is released, the lock-up control system comprising:

means for detecting the speed of said vehicle and for generating a vehicle speed signal;

means for comparing said vehicle speed signal with a reference value and for generating a comparison signal;

means responsive to said comparison signal for determining when said automotive vehicle is operating in a predetermined lock-up range and for generating a lock-up permission signal when the automotive vehicle is operating in a predetermined lock-up range;

means for detecting a command for shifting between gear ratios and for generating a shift command indicative signal;

means responsive to said shift command indicative signal for generating a gear shift signal;

means for determining a load on said engine and for generating an engine load indicative signal;

means, responsive to said engine load indicative signal for delaying said shift command indicative signal by a period of time which varies according to said engine load; and

means, responsive to said lock-up permission signal and said gear shift signal for engaging the lock-up clutch when said lock-up permission signal is present and said gear shift signal is absent and for releasing said lock-up clutch when the gear shift signal is present regardless of the generating of the lock-up permission signal.

4,457,411

TORQUE TRANSMISSION DEVICE

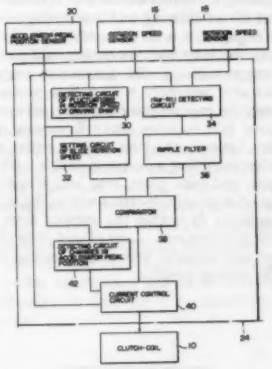
Takeo Hiramatsu, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1981, Ser. No. 267,627

Claims priority, application Japan, Jun. 2, 1980, 55-74064; Jun. 24, 1980, 55-85579

Int. Cl.³ B60K *41/02*; F16H *45/02*

U.S. Cl. 192—0.076 **13 Claims**



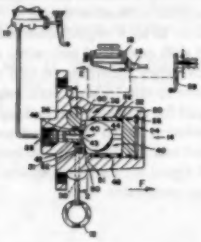
1. Torque transmitting device comprising a driving shaft rotated with a tortional vibration, an output shaft, a clutch means for transmitting torque from said driving shaft to said output shaft while enabling relative rotation between said shafts, means for securing a difference in rotation speed between said driving shaft and said output shaft, means for sensing the amplitude of fluctuation in rotation speed of said driving shaft, and torque transmitting control means for controlling the transmission of torque by said clutch means from said driving shaft to said output shaft in the manner that the difference in rotation speed between said shafts is greater than the amplitude of fluctuation in rotation speed of said driving shaft sensed by said means for sensing the amplitude of fluctuation in rotation speed.

4,457,412

BRAKE CONTROL MECHANISM

Donald D. Johannesen, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 2, 1981, Ser. No. 307,920
Int. Cl.³ B60K *41/24*
U.S. Cl. 192—13 A **5 Claims**



1. A brake control mechanism fluidly communicating a master cylinder with a brake assembly and operably connected to a clutch assembly, the mechanism comprising a housing defining a stepped bore therethrough, an inlet communicating the master cylinder with the stepped bore, an outlet communicating the stepped bore with the brake assembly, a valve assembly disposed within the stepped bore to open and close communication between the inlet and outlet and an actuator assembly operatively coupled to the clutch assembly and extending into the stepped bore to control operation of the valve assembly, characterized in that said actuator assembly includes a plate pivotably carried within the stepped bore, said valve assembly including a member movable in response to the angular orientation of the housing and a seat disposed within the stepped bore engageable with the member to close communication between the inlet and the outlet, said plate defining a central opening permitting said member to engage said seat when said actuator assembly is in a first position, and said actuator assembly is movable to a second position to pivot said plate and move said member away from said seat to open communication between the inlet and the outlet, said actuator assembly further including a cam engageable with said plate to pivot the latter, said cam, plate, seat, and member being substantially aligned at an axial location within the stepped bore in order to compactly fit within the stepped bore and also to provide for the pivoting movement of said plate about the axial location when said actuator assembly is moved from the first position to the second position.

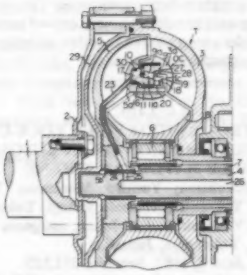
4,457,413

FLUID TORQUE CONVERTER

Torao Hattori, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1981, Ser. No. 318,985
Claims priority, application Japan, Nov. 7, 1980, 55-157263
Int. Cl.³ F16D *39/00*
U.S. Cl. 192—3.3 **5 Claims**

1. A fluid torque converter comprising: a pump wheel connected to a driving power source; a turbine wheel connected to a driven member; said pump wheel and said turbine wheel being connected to each other via a working fluid; and a one-way clutch arranged in a space defined by inner walls of said pump wheel and said turbine wheel and adapted to mechanically connect said pump wheel and said turbine wheel together when said one-way clutch is in a coupled state; said one-way clutch comprising a driving clutch member spline-connected to the inner wall of said pump wheel and having a first conical surface, a driven clutch member connected to said turbine wheel and having a second conical surface in opposed and parallel relation to said first conical surface, a wedge roller means of an elastic material provided between said first and second conical surfaces, and means for moving said driven and driving clutch members relatively to each other between an operative position in which said driven and driving clutch members are mechanically connected to each other via said wedge roller means, and an inoperative position in which said driven and driving clutch members are mechanically disconnected from each other, said means for moving said driving and driven clutch members relatively to each other between said operative and inoperative positions comprising a hydraulic chamber formed in the inner wall of said pump wheel and



communicated selectively with a hydraulic power source and an oil tank by a change-over valve which is adapted to control supply of hydraulic pressure to the hydraulic chamber, a piston slidably fitted in said hydraulic chamber and operatively connected to said driving clutch member, and means biasing said piston towards said hydraulic chamber, said piston being operated under the action of the hydraulic pressure in said hydraulic chamber to move said driving clutch member along the inner wall of said pump wheel into engagement with and disengagement from said driven clutch member.

4,457,414

Patent Not Issued For This Number

4,457,415

ADJUSTABLE SHOE CLUTCH AND BRAKE ASSEMBLY

R. B. Omo, Jr., Bath, Me., assignor to Bath Iron Works Corporation, Bath, Me.

Filed Mar. 3, 1982, Ser. No. 354,370
Int. Cl.³ B60R *41/24*
U.S. Cl. 192—12 C **7 Claims**

1. In a machine of the fly wheel power press type having a support housing, a drive shaft mounted for rotation in said

support housing, fluid supply means for said drive shaft, a fly wheel on said drive shaft, a clutch drum secured to said fly wheel, and a brake drum secured to said support housing, an adjustable shoe clutch and brake assembly comprising:

(a) an H-shaped yoke having a cross-bar and a pair of uprights extending on either side therefrom and said cross-bar including a sleeve coaxially mounted on said drive shaft;

(b) said uprights of said H-shaped yoke each having journals at their upper and lower ends to form a pair of cooperating upper journals and a pair of cooperating lower journals;

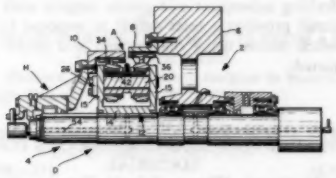
(c) separate pivot pin means supported by each cooperative pair of journals;

(d) each of said pivot pin means having movably mounted thereon a brake shoe and a clutch shoe for thereby providing a pair of brake shoes and a pair of clutch shoes for cooperation with their respective brake drum and clutch drum;

(e) said pivot means being eccentric for providing rotational adjustment of its respective brake shoe by eccentric movement relative to its respective clutch shoe;

(f) each of said pivot pin means including a knurled portion;

(g) a pair of lock plates, each of said lock plates including a knurled aperture therethrough for cooperating with said knurled portion of its associated pivot pin means for sliding engagement therewith;



(h) adjustment means associated with each of said lock plates and said uprights for positively securing each of said lock plates in a pre-selected adjustment position to an associated one of said uprights for adjustably positioning each of said lock plates relative to its associated upright;

(i) said cross-bar having on either side thereof a piston cylinder assembly;

(j) said piston cylinder assemblies each including fluid passage means for connection to said drive shaft fluid supply means to bring a fluid to and exhaust said fluid from said assembly;

(k) said pivot means each having mounted thereon a rocker;

(l) one of said rockers connect at one end to one of said piston cylinder assemblies and movable thereby and the other of said rockers connected at one end to the other of said piston cylinder assemblies and movable thereby;

(m) said pair of brake shoes being mounted to said pivot pin means offset from said pair of clutch shoes whereby during operation of said clutch and brake assembly only one pair of said shoes will be operable at any time;

(n) first spring means connected at one end to one of said piston cylinder assemblies and at the other end to one of said rockers;

(o) second spring means connected to one end to the other of said piston cylinder assemblies and at the other end of the other of said rockers;

(p) whereby, introduction of said fluid into said piston cylinder assemblies causing displacement of said piston cylinder assemblies for engaging said clutch shoes with said clutch drum thereby so that said assemblies and said drive shaft will be driven by said fly wheel; and,

(q) whereby, when said fluid is exhausted from said piston cylinder assemblies said brake shoes will be driven thereby against said brake drum by said spring means to brake said drive shaft.

4,457,416

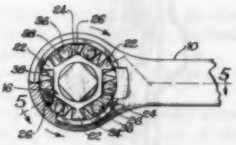
LASHLESS SOCKET DRIVE

James W. Kutzler, 4 Broadway Sp 06, Chula Vista, Calif. 92010

Filed Jan. 7, 1982, Ser. No. 337,656

Int. Cl.³ F16D *15/00*

U.S. Cl. 192—44 **3 Claims**



1. A reversible, unidirectional drive mechanism comprising:

(a) a driving member;

(b) a driven member;

(c) one of said members defining a substantially circular chamber with a circular wall and other member having a rotor internally of said chamber;

(d) said rotor defining ramps and having a plurality of radial baffles which define therebetween discrete ramp spaces bordered on opposite sides by said chamber wall and said ramps;

(e) each of said ramp spaces including two contiguous ramps meeting at a vertex and defining convergent ramp spaces toward said vertex;

(f) a circular bearing for each ramp and including means urging same toward said vertex; and

(g) a keeper mounting a finger for each vertex and said fingers being dimensioned and positioned to concomitantly snap past said vertices with an over-the-center action, selectably to the clockwise or counter-clockwise sides thereof to hold the respective bearings away from said vertices and out of wedging engagement in said ramp spaces, whereby said fingers and vertices together double as the reverse mechanism, and as an over-the-center detent mechanism to hold the drive mechanism in the selected mode.

4,457,417

TORQUE RESPONSIVE FLUID COUPLING DEVICE

Gerard M. Light, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 13, 1981, Ser. No. 282,978

Int. Cl.³ F16D *31/00*

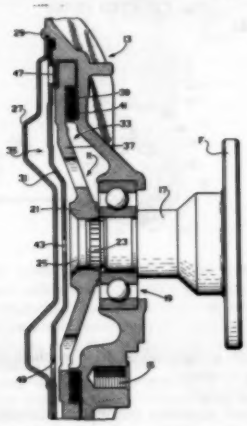
U.S. Cl. 192—58 B **6 Claims**

1. In a fluid coupling device of the type including a first rotatable coupling member defining an axis of rotation, cover means associated with the first coupling member to define a

fluid chamber therebetween, means disposed to separate the fluid chamber into a fluid operating chamber and a fluid reservoir chamber, a second rotatable coupling member disposed in the fluid operating chamber and being rotatable relative to the first coupling member, the first and second coupling members cooperating to define a shear space therebetween and operable to transmit torque in response to the presence of fluid therein, the improvement comprising:

(a) the separating means defining a fluid orifice operable to permit reversible fluid communication in either direction between the fluid operating chamber and the fluid reservoir chamber;

(b) pump means operatively associated with one of the separating means and the first rotatable coupling member to



pump fluid from the operating chamber through said fluid orifice to the reservoir chamber, to achieve a disengaged condition, in response to the difference between the rotational speeds of the first and second coupling members exceeding a predetermined value whereby the pressure generated by said pump means is greater than the centrifugal force acting on fluid in the reservoir;

(c) said fluid orifice being selected such that, when the speed difference goes below said predetermined value, centrifugal force acting on fluid in the reservoir chamber overcomes the pressure generated by said pump means to cause fluid to flow from the reservoir chamber through said fluid orifice to the operating chamber, to reverse direction of flow through said fluid orifice and achieve an engaged condition.

4,457,418

SAFETY SYSTEM

Robert W. Johnston, Auburndale, Mass., assignor to Black & Webster, Inc., Waltham, Mass.

Filed Nov. 19, 1981, Ser. No. 322,990

Int. Cl.³ B30B *15/16*; F16P *3/00*

U.S. Cl. 192—129 B **10 Claims**

1. A safety system for a power stroke machine comprising:

a probe for sensing an obstruction in the work area;

means for moving said probe between an extended position to sense obstructions in the work area and a retracted position;

means for detecting said probe in said retracted position;

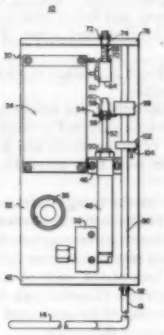
means for detecting said probe in said extended position;

start switch means for driving said means for moving to selectively move said probe between said extended and retracted positions;

a power output circuit responsive to said start switch means and said means for detecting said probe in said extended position for providing a power output to operate a power stroke machine when said start switch means is closed and said probe is in said extended position;

a reset circuit for providing a set output in response to either said start switch means being closed or said probe being not retracted;

a latching circuit, responsive to said set output and said power output, for providing a latch output as long as said set output continues; and



an output control circuit, responsive to said latch output for transmitting the initially occurring said power output and blocking subsequent said power outputs until said reset circuit provides a reset output in response to said start switch means being opened and said probe being retracted.

4,457,419

CONVEYING/POSITIONING APPARATUS FOR SHEET MATERIAL

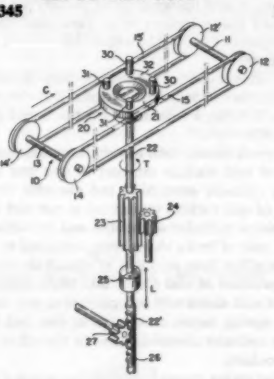
Nobutoshi Ogami, Hikone; Takeshi Takada, Shiga; Mikio Shoda, Omi-hachiman, and Yasuhiro Kurata, Hikone, all of Japan, assignors to Dainippon Screen Mgf., Co., Ltd., Kyoto, Japan

Filed Mar. 19, 1982, Ser. No. 359,780

Claims priority, application Japan, Apr. 3, 1981, 56-50982

Int. Cl.³ B65G *47/22*

U.S. Cl. 198—345 **11 Claims**



1. An apparatus for conveying and positioning a circular sheet material to be processed comprising

a conveying assembly including at least two pairs of pulleys, each of the respective pairs of pulleys being connected by an axle; and a pair of belts, the belts being stretched in

parallel between the pulleys on the same side of said axles, the spacing between said belts being selected so as to hold the material at its peripheral edge, the material being conveyed on the belts as they move, and

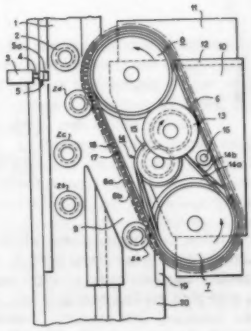
a positioning assembly including a base having projections on the surface thereof adaptable to hold the material at a predetermined position, the material being received on said base and among said projections; a rotatable shaft fixed to said base at the top of the shaft and having rotation means for rotation of said base; and an elevation rod connected to the other end of said shaft through coupling means which enables said shaft and rod to be independently operated, said rod having elevation means for raising and lowering the positioning assembly to predetermined positions, said base being raised and lowered by means of said elevation means and also being rotated by means of said rotation means, said base located between the two pairs of pulleys and between the belts wherein the projections provided on the base surface comprise two kinds of projections, one being taller and the other shorter, said projections being positioned on a circumference slightly greater in diameter than the material so as to hold the material at the peripheral edge thereof by means of said projections.

4,457,420

APPARATUS FOR DIVERTING OBJECTS FROM A MAIN CONVEYOR PATH

Marcel L. Ducloux, Le Pecq, France, assignor to Saint-Gobain Emballage, France

Filed Mar. 8, 1982, Ser. No. 355,612
Claims priority, application France, Mar. 9, 1981, 81 04671
Int. Cl.³ B65G *47/41, 47/32*
U.S. Cl. 198—369 **14 Claims**



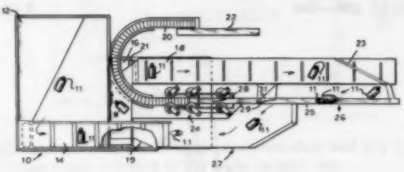
1. An apparatus for diverting selected objects from a stream of objects moving seriatim along a main, horizontal path of movement including diverting means having an operator capable of movement in a direction generally transverse to said main path through a stroke whose length is less than the width of said selected object to be diverted, an auxiliary means of conveyance for moving each selected object diverted from said main path toward a discharge station, said auxiliary conveyance means extending partially into said main path and including suction means for supporting each selected object in movement, means for locating said diverting means in a position along said main path whereby said stroke of said operator is directed substantially toward the portion of said auxiliary conveyance means extending partially into said main path.

4,457,421

BOTTLE ORIENTATION APPARATUS

Robert J. Krooss, 74 Bali Rd., Mountain Lakes, N.J. 07046, and David D. Demarest, 58 Maple Ave., Pine Brook, N.J. 07058

Filed Apr. 24, 1981, Ser. No. 257,155
Int. Cl.³ B65G *47/14*
U.S. Cl. 198—396 **4 Claims**



1. A bottle orientation apparatus, for the stand-up orientation of a plurality of bottles in a linear array, said bottle orientation apparatus comprising:

(a) means for conveying a plurality of bottles in one direction;

(b) means for aligning said conveyed bottles under the influence of gravity, so that the major axis of each of said bottles is parallel to the direction of movement, said alignment means including an alignment chute for conducting aligned bottles along said alignment means, first deflection means disposed upstream of and above said alignment chute, so that said bottles move downwardly and are deflected from said one direction into said alignment means, and along said alignment chute, second deflection means downstream of said first deflection means including a plow disposed above said alignment chute to engage a jamming bottle, said plow being fixedly mounted and angularly disposed, so as to engage a jam-up bottle and deflect same from said alignment chute; receiver means disposed below said plow for collecting said jam-up bottle when deflected by said plow, and transferring means for conveying said deflected bottle from said receiver means to said conveying means of (a);

(c) means to impart differential forces to the leading and trailing portions of each of said bottles delivered in turn by said alignment chute so as to cause each of said bottles to be uprighted, said means to impart differential forces comprising a first entrance pair of side gripping belts disposed over a stand-up chute, and being provided with a transition for engaging said leading or trailing portions of said bottles, together with a first exit pair of side gripping belts parallel to and partially overlapping said first entrance pair of side gripping belts, said belts frictionally engaging opposed end portions of each of said bottles;

(d) means to move said belts, said first entrance pair of side gripping belts operating and giving at a faster speed than said first exit pair of side gripping belts, so that differential speed frictional engagement is imparted to bottle portions adjacent each of said bottle ends, while said bottles are moving downwardly under the influence of gravity, carrying an uprighting action to each of said bottles due to said entrance belt pair moving faster than said exit belt pair, so as to cause a pushing upward on the trailing portions of each bottle and gripping the leading portion of said bottle, so as to upright said bottle;

(e) an exit conveyor disposed downstream of said first pair of exit belts, and means to move said exit conveyor at about the same speed as the speed of said first pair of exit belts; and

(f) said belts being angularly disposed, so that said bottles are influenced by gravity, and said exit conveyor being horizontally disposed, so as to support those bottles oriented in an upright position with base end down.

4,457,422

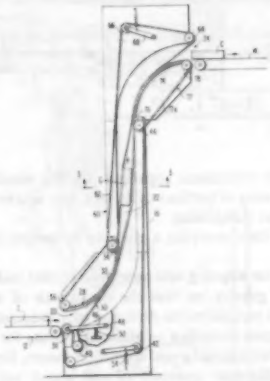
ELEVATOR CONVEYOR

Stanley E. Hurd, Sunnyvale, Calif., assignor to Machine Development Company, Inc., Dublin, Calif.

Continuation of Ser. No. 31,289, Apr. 19, 1979, abandoned, which is a division of Ser. No. 845,317, Oct. 25, 1977, abandoned. This application Sep. 23, 1980, Ser. No. 189,963

Int. Cl.³ B65G *15/14*

U.S. Cl. 198—604 **7 Claims**



1. An elevator conveyor for conveying cartons having substantially flat upper and lower surfaces spaced substantially parallel to each other from one elevation to another comprising a machine frame having a conveyor path therethrough extending from one elevation to another, said conveyor path including:

(a) an entrance section having a curved path through which articles are moved from a generally horizontal to a generally vertical orientation;

(b) an intermediate section through which articles are moved generally vertically, and,

(c) an exit section having a curved path through which articles are moved from generally vertical to horizontal orientation,

said entrance section being defined by first convex support member and by spaced confronting first and second belt means trained over the convex support member, a first pair of spaced pulleys positioned at opposite ends of the convex support member for supporting the first belt means over the first convex support, one of the first pair of pulleys located at the entrance to the conveyor path and the other being located at the beginning of the intermediate section of the conveyor path,

a second pair of spaced pulleys one of which is located at the entrance to the conveyor path and the other being located at the terminal end of the intermediate section of the conveyor path, said second pair of spaced pulleys for supporting the second belt means through the entrance and intermediate sections of the conveyor,

said exit section being defined by second convex support member and by spaced confronting third and fourth belt means trained over the second convex support member, third and fourth pulley members located on opposite sides of the conveying path at the exit point from the conveyor,

each of said third and fourth belt means being trained over the second convex support member in confronting relation to each other to define the exit section of the conveyor path, the third belt means being supported by the other of said second pair of pulleys and by the third pulley member, and the fourth belt member being supported by the other of said first set of pulley members and by the fourth pulley member, the second belt member and said fourth belt member being in confronting relationships over a portion of their path to define the intermediate section of the conveyor, and means for driving the confronting portions of said belt members in the same direction for conveying cartons,

said second belt means and third belt means each comprising a pair of spaced belt members for engaging the lower carton surface, said first belt means and said fourth belt means each comprising a single belt member for engaging the upper carton surface said first belt member lying between the spaced second belt members through the entrance section, and the fourth belt members through the intermediate and exit sections of the conveyor,

the first and second belt means being spaced from each other at the entrance to the conveyor,

and pressure feed means including a pair of arms pivotally connected to the machine frame, a wheel fitted to each arm for engagement with the underside of cartons arriving at the entrance section of the conveyor, and means for pressing each wheel into engagement with said cartons so that the top side of each carton positively engages the first belt means as the leading underside edge of each carton engages the second belt means.

4,457,423

CONVEYOR SYSTEM

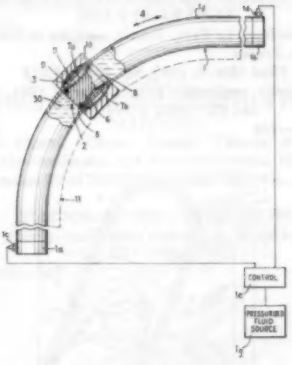
Kurt Stoll, Lenzhalde 72, 7300 Esslingen/N., Fed. Rep. of Germany

Filed May 18, 1981, Ser. No. 264,528

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023036

Int. Cl.³ B61B *13/12*; B65G *19/18, 35/00*

U.S. Cl. 198—619 **13 Claims**



1. A conveyor system, comprising a pipe which is made of a nonmagnetic material and has a curved portion, an inner surface, an outer surface and two ends; a piston axially slidably disposed within said pipe, sealing engaging said inner surface of said pipe, and including first magnetic means; means for effecting a fluid-tight seal at each of said ends of said pipe; means for selectively supplying fluid to and removing fluid from said pipe on opposite sides of said piston to effect reciprocal movement of said piston within said pipe lengthwise thereof; a runner slidably supported on said outer surface of said pipe for axial movement with respect to said pipe and including second magnetic means, said first and second magnetic means magnetically coupling said piston and said runner so that said runner moves axially of said pipe with said piston; and means for facilitating movement of said piston and said runner along said curved portion of said pipe, including an outer surface on said piston which faces said inner surface of said pipe and an inner surface on said runner which faces said outer surface of said pipe, said outer surface on said piston and said inner surface on said runner each having a profile, in an axial direction, which is concave and arcuate.

3. A conveyor system, comprising a pipe having a curved portion and two ends, a piston disposed within said pipe and sealingly slidably engaging an inner surface thereof, means for sealing each said end of said pipe, means for selectively supplying fluid to and removing fluid from said pipe on opposite sides of said piston to effect reciprocal movement of said piston within said pipe lengthwise thereof, and a runner slidably supported on an outer surface of said pipe for movement lengthwise thereof, said piston and said runner being drivingly coupled by magnetic means which produces a magnetic attraction therebetween, said piston having an outer surface and said runner having an inner surface, said outer surface of said piston and said inner surface of said runner each having a profile, in an axial direction, which is concave and arcuate, thereby facilitating movement of said piston and said runner along said curved portion of said pipe.

4,457,424

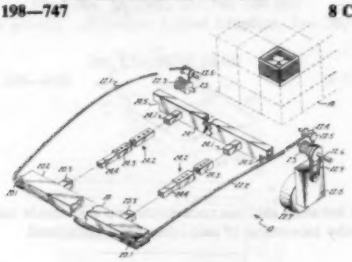
APPARATUS FOR LOADING AND UNLOADING VEHICLES

Charles L. Wuensch, Rte. 1, Coon Valley, Wis. 54623

Filed Aug. 3, 1981, Ser. No. 289,711

Int. Cl.³ B65G *25/00, 67/02*

U.S. Cl. 198—747 **8 Claims**



4. Apparatus for moving a load of containers slideably along a floor in a given path of travel and comprising:

an elongated pull bar positionable at floor level and having a forward surface contactable with the load, and cable rollers carried at ends of the pull bar;

cable means comprising a single cable length extending behind the load and trained about said cable rollers, the cable means providing a pair of cable runs extending along the length of the load, and winch means carried adjacent the floor level, the cable runs having forward ends attached to the winch means;

whereby driving the winch means orients the pull bar with respect to the load, equalizes tension in the cable runs, and causes the load to be drawn across the floor along the path of travel.

4,457,425

MAGNETIC HOLDER FOR KEYS AND THE LIKE AND METHOD OF MANUFACTURING THE SAME

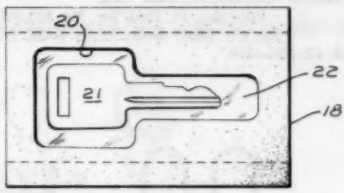
Rosemary J. Cooper, East Longmeadow, Mass.; Devineni V. Ratnam, Huntington, N.Y., and Bob O. Burson, East Longmeadow, Mass., assignors to Phelon Magnagrip Co., Inc., East Longmeadow, Mass.

Filed Apr. 21, 1983, Ser. No. 487,040

Int. Cl.³ A45C *11/00;* **B65D** *75/32;* **G09F** *3/18*

U.S. Cl. 206—38 **8 Claims**

1. Magnetic holder for storing a key or other small article by magnetically attaching the holder to a ferrous metal surface comprising an integral strip of magnetic plastic material, said strip including a flat central web portion and inturned side edge channels, said web portion including a cut-out there-



through having a size and shape to accommodate said key or other object when oriented in the plane of said web.

4,457,426

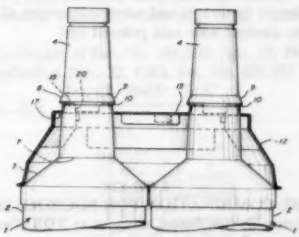
MULTIPLE BOTTLE ASSEMBLY

Romilly H. Humphries, Dover, Mass., assignor to S.A.Y. Industries, Inc., Leominster, Mass.

Continuation-in-part of Ser. No. 310,095, Oct. 9, 1981, abandoned. This application May 11, 1983, Ser. No. 493,584

Int. Cl.³ B65D *85/62, 71/00, 75/00*

U.S. Cl. 206—158 **11 Claims**



5. In combination a plurality of bottles and means for commonly carrying said bottles comprising:

a plurality of bottles, with each bottle being molded of thermoplastic material and having an elongated tapered neck with an annular flange integrally formed in said neck intermediate the ends thereof, said flange having an upper surface closer to the bottle opening, said upper surface being positioned non-perpendicularly with respect to longitudinal axis of said bottle and a lower surface closer to the bottom of said bottle, said lower surface being positioned non-perependicularly with respect to the longitudinal axis of said bottle, said upper surface being at least twice the width of said lower surface, said upper and lower surfaces being positioned at an angle with respect to each other and and forming a barb-like configuration in cross-section, said bottle having an upper portion adjacent said neck, said upper portion being tapered in a conic section, said elongated tapered neck being tapered at an angle;

a means for commonly carring said bottles comprising a one-piece integrally molded plastic sheet having means forming a plurality of openings each of which is shaped to receiving a neck of one of said bottles; and

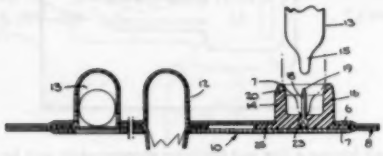
means projecting from the edge of each of said openings for engaging said flange and securing said neck in said opening.

4,457,427

CAPSULE PUNCTURING DEVICE

Thomas A. Cafiero, Brooklyn, N.Y., assignor to Michigan Hanger Company, Hubbard, Ohio

Filed Sep. 14, 1982, Ser. No. 420,091
Int. Cl.³ B65D *69/00, 35/56;* B43K *5/14*
U.S. Cl. 206—229 8 Claims



1. A card-type package for holding and puncturing elastic capsules and the like comprising:

(a) one or more layers of a flexible supporting sheet;

(b) one or more elastic capsules attached thereto; and

(c) puncturing means affixed to said sheet comprising

(i) a cup-shaped guiding member having an inwardly-tapered interior lip, and which is shaped so as to admit at least a portion of said capsule into the interior space of said guiding member; and

(ii) a pin axially aligned within the interior space of the guiding member so as to contact and pierce said admitted capsules, wherein said pin has a pointed end which is positioned at or below the plane formed by the lip of the cup-shaped guiding member, and whereby said interior lip directs said admitted portion of said capsule into contact with said pointed end.

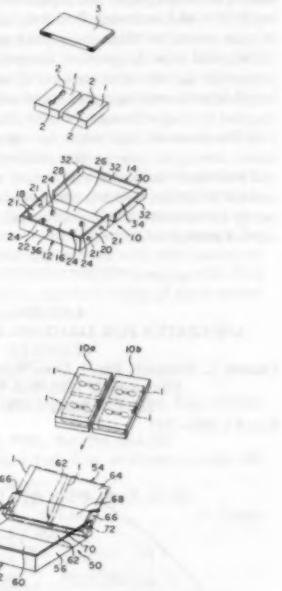
4,457,428

CASE COMBINATION FOR MICROCASSETTE

Hideya Saito, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed May 5, 1982, Ser. No. 374,924
Claims priority, application Japan, May 22, 1981, 56-73327[U]
Int. Cl.³ B65D *85/672*
U.S. Cl. 206—232 5 Claims

1. In combination with a plurality of microcassettes, a case combination containing said microcassettes, said case combination comprising a first inside case containing said microcassettes which is constructed and sized for closely enclosing two of said microcassettes contained therein, a second outside case for microcassettes, said second outside case containing two of said inside cases and being constructed and sized for closely enclosing two of said first inside cases for microcassettes contained therein, said second outside case having the same outline dimensions as a case for standard compact cassettes, wherein the first inside case for microcassettes consists of a main body part and a cover, the main body part being provided with a bottom wall, a rear wall, two side walls and a front wall coupled solidly with said bottom wall, one edge of said rear wall being pivoted on said bottom wall, the cover being pivoted on the other edge of said rear wall, and stopper means constructed and positioned to fit hub holes of two microcassettes in said case and arranged only on said bottom wall, wherein a thickness of said microcassettes in a direction of said stopper means is such that a space remains between said inside case cover and said microcassettes, and wherein said case combination includes a chattering prevention member in said inside case and pressed between said microcassettes and said inside case cover, said chattering prevention member being sized so as to fill said



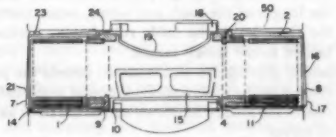
space between said microcassettes and said inside case cover whereby movement of said cassettes is prevented.

4,457,429

PACKAGE FOR RECORDING MEDIA

Manfred Huber, Oberkirch, and Robert Schindler, Baden-Baden, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 26, 1982, Ser. No. 352,859
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 8109502[U]
Int. Cl.³ B65D *85/672*
U.S. Cl. 206—394 4 Claims



1. A package for a plurality of stacked rolls of recording media in tape form wound on annular flangeless hubs or flanged reels, the package being provided with central holding means for at least one of the hubs or flanged reels and comprising a bottom member and a cover member whose inside diameter is somewhat larger than the outer diameter of the fully wound hubs or reels, said members being designed to be releasably connected together, and said members together having the shape of a cylindrical cheesebox,

the bottom member being substantially flat and having, as said central holding means, a substantially cylindrical projection extending inwardly into the interior of said package, finger spaces being provided between the circumference of said substantially cylindrical projection on

the bottom member and the inner perimeter of the annular hubs or reels, for insertion and removal of the tape-carrying hubs or reels without touching the tape,

the cover member having the shape of a cylindrical hood with a central hollow projection extending inwardly into the interior of said package in coaxial relationship with respect to the substantially cylindrical projection on the bottom member.

a first handle being provided on and within the confines of said hollow projection of said cover member, said handle having a carrying portion dimensioned so that, upon insertion of the fingers of the user into said hollow projection, the entire closed package with the plurality of rolls of recording media therein may be carried thereby, and

a second handle being provided on said central projection on the bottom member for carrying the bottom member with or without rolls of recording media, said second handle extending inwardly and hence in the same direction as said substantially cylindrical projection of said bottom member.

4,457,430

TAMPER RESISTANT SECURITY PACKAGE

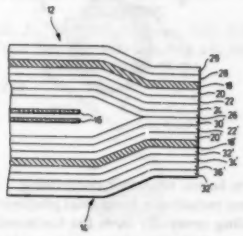
Stewart A. Darling; Tadeusz Kostanecki, and George Soos, all of Toronto, Canada, assignors to DRG Inc., Toronto, Canada

Filed Jun. 13, 1983, Ser. No. 504,003

Claims priority, application United Kingdom, Jun. 25, 1982, 8218460

Int. Cl.³ B65D *73/00*

U.S. Cl. 206—459 **15 Claims**



1. A tamper-resistant package for an article to which access is intended only by destruction of the package, comprising two webs of sheet material having inner surfaces securable together around their peripheries to form the package with the article lying between the webs,

a solvent indicator ink printed on one of the webs, said solvent indicator ink comprising an organic dye which bleeds to a visible part of the package upon application of a readily-available common polar or non-polar solvent,

a water-sensitive coating on one of the webs which produces a visible indication if an attempt is made to open the package with water,

a heat-sensitive ink printed on one of the webs which produces a visible change when an attempt is made to open the package by the use of heat.

4,457,431

STACKABLE DEFORMABLE-SIDE SOFT BOX

Burton R. Lundquist, and Christopher P. DeCoster, both of Scottsdale, Ariz., assignors to Armour Food Company, Omaha, Nebr.

Filed Feb. 16, 1982, Ser. No. 349,273

Int. Cl.³ B65D *77/22*

U.S. Cl. 206—491 **3 Claims**

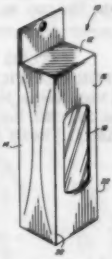
1. An elongated stackable box having a deformable midsection, comprising:

first and second opposed ends;

at least three sides lying parallel to a common axis and meeting adjoining ones of said sides at edges;

said sides having a meeting with each of said ends so that said ends tend to maintain the sectional character of said box;

at least one of said sides having a longitudinal arcuate score



having its termini adjoining the adjacent edge of the box for permitting flexure without irregular creasing when the adjacent edge is inwardly compressed; and

said arcuate score having unscored regions between its termini and the adjoining edge so that said box tends to reform to its original shape when the compressive force is released.

4,457,432

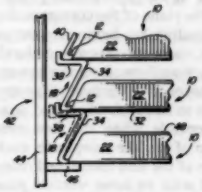
INTERLOCKING STACKABLE TRAY

Allan D. Solheim, 14032 N. Canterbury Dr., Phoenix, Ariz. 85023

Continuation-in-part of Ser. No. 369,599, Apr. 19, 1982. This application Nov. 22, 1983, Ser. No. 554,195

Int. Cl.³ B65D *21/02*

U.S. Cl. 206—503 **8 Claims**



1. An interlocking stackable tray comprising:

(a) a bottom wall of planar configuration and having an opposed pair of substantially parallel side edges; and

(b) a pair of sidewalls extending integrally and generally upwardly from different ones of the pair of side edges of said bottom wall, said pair of sidewalls being inwardly deflectable toward each other into interlocking supporting engagement with a like tray upon stacked placement of the like tray thereon, each sidewall of said pair of sidewalls including,

I. a planar section extending angularly upwardly and inwardly from its respective one of the pair of side edges of said bottom wall and defining an upper end,

II. a ledge extending outwardly from the upper end of said planar section and normally lying in a plane which slopes angularly and downwardly relative to the plane of said bottom wall so that when the like tray is stackingly placed on said sidewall, the force resulting from the weight of the like tray will be concentratingly exerted on the upper end of said planar section to inwardly deflect said sidewall which moves said ledge

into supporting contiguous engagement with the bottom wall of the like tray adjacent one of its pair of side edges, said ledge having an outer end,

III. a lip extending generally upwardly from the outer end of said ledge for movement with said sidewall into gripping engagement with the one of the pair of side edges of the bottom wall of the like tray upon stacked placement of the like tray on said sidewall.

4,457,433

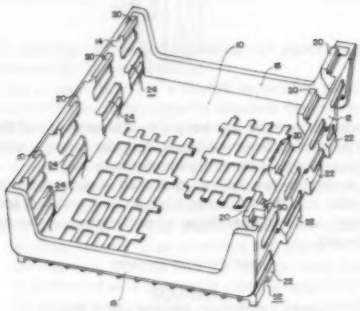
KEY LOCK FOR PLASTIC RECEPTACLES

James D. Wilson, 421 Vista Suerte, Newport Beach, Calif. 92660

Filed Jan. 31, 1983, Ser. No. 462,540

Int. Cl.³ B65D *21/04*

U.S. Cl. 206—505 **2 Claims**



1. A key lock for use with receptacles adapted to be stacked and nested with one another, each receptacle including a pair of side walls, a plurality of discrete upwardly extending lugs formed along the upper edge of each of the side walls and extending therealong in spaced relationship with respect to one another, each upwardly extending lug being displaced inwardly from the plane of the corresponding side wall, and each upwardly extending lug having an outwardly facing vertical planar surface, and a corresponding plurality of discrete downwardly facing lugs formed on the lower edge of each of the side walls in respective vertical alignment with the upwardly extending lugs to be received on said upwardly extending lugs of a like receptacle when the first-mentioned receptacle is stacked on top of the like receptacle, each of the downwardly extending lugs of the first-mentioned receptacle having a vertical front wall with an inner vertical planar surface engaging the vertical planar surface of the corresponding upwardly extending lug of the like receptacle, a key lock comprising: a projection formed on one of said upwardly extending lugs and extending transversely outwardly from the vertical planar surface thereof with the top of said lug being coplanar with the top of the corresponding upwardly extending lug, and the downwardly extending lug of the like receptacle which interacts therewith having a slot in the front wall thereof in position to receive said projection.

4,457,434

APPARATUS FOR ORIENTING, SINGULATING AND SIZING MUSHROOMS AND LIKE OBJECTS

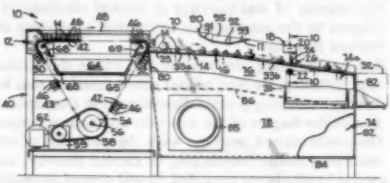
Gregory J. Brown; Meredith E. Smith, Jr.; Hasmukh T. Shah, all of San Jose, Calif., and Cecil D. Beadles, deceased, late of San Jose, Calif., by Nancy L. Beadles, executrix, assignors to FMC Corporation, Chicago, Ill.

Filed Feb. 1, 1982, Ser. No. 344,573

Int. Cl.³ B07C *5/10*

U.S. Cl. 209—539 **10 Claims**

1. In an article sorting system, means for conveying articles in a predetermined direction including a perforated plate for supporting the articles, means for directing air against the underside of the articles to reduce the frictional engagement of said plate with articles moving therealong, said plate having a section of reduced width, tunnel means for restricting the upward flow of air at said reduced section to form a mass of air



in the path of movement of articles traveling along said section of conveying means, said tunnel means including an upper imperforate wall having a central section oriented substantially parallel to said plate and an entrance wall inclined downwardly toward said plate.

4,457,435

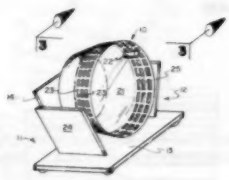
POPCORN KERNAL SEPARATOR

Larry W. Truman, 235 E. Center, Kaysville, Utah 84037

Filed Sep. 25, 1981, Ser. No. 305,530

Int. Cl.³ B07B *1/22*

U.S. Cl. 209—683 **3 Claims**



1. A popcorn kernal separator comprising:

a support base including a horizontal platform and a support leg extending upwardly from the horizontal platform;

a drum having a fully closed rear wall, a side wall extending from the periphery of the rear wall, defining an inlet opening into the drum and including a first wall portion forming with the rear wall, a closed dish-like portion and a perforated wall portion extending therefrom to said inlet opening,

said perforated wall portion permitting the passage of unpopped kernals therethrough and preventing passage of popped popcorn kernals;

a post extending from the support leg;

means defining a hole formed centrally into a portion of the rear wall, said hole slidably fitting over the post to journal the center of the rear wall to the upwardly extending leg whereby the drum is rotatable over the horizontally extending platform and is easily placed on and removed from the post;

a removable cover adapted to close the inlet opening defined by the side wall; and

handle means for rotating the drum about the journal connection with the upright leg.

4,457,436

J-SHAPED WALL RAIL SYSTEM

Laurence J. Kelley, Tacoma, Wash., assignor to Comerco, Inc., Tacoma, Wash.

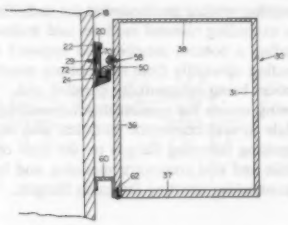
Filed Nov. 2, 1981, Ser. No. 317,437

Int. Cl.³ A47F *5/08*

U.S. Cl. 211—88 **9 Claims**

1. A wall rail for providing support to a modular unit which

is removeably secured thereto, said wall rail comprising a vertical back fixedly fastened to a wall, said vertical back having an upper horizontal extension extending from the upper edge of said vertical back and a lower horizontal extension extending from the lower edge of said vertical back, each said extensions extending outward from said wall; said upper horizontal extension defining an upper channel opening onto said



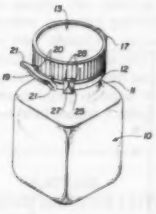
wall and an upper slot opening towards said lower horizontal extension; said lower horizontal extension defining a lower channel opening onto said wall, a lower slot coplanar with and opening toward said upper slot, and a J-shaped key channel, said key channel opening towards said vertical back adjacent said lower slot; the hook and longer leg of said key channel providing contact surfaces for support of said modular unit.

4,457,437

TAMPER EVIDENT CHILD-RESISTANT CONTAINER CLOSURE

Harry G. Heath, Jr., Box 192, Milmay, N.J. 08340

Filed Dec. 9, 1982, Ser. No. 448,303
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—224 **11 Claims**



1. A tamper evident child-resistant container closure comprising a container body and a closure cap for the container body, the container body and closure cap having cooperative snap-engageable parts which lock the closure cap onto the container body and permit rotation of the closure cap in either direction of rotation freely while locked to a closure cap release position, and cooperative tamper indicating means on the container body and closure cap including circumferentially spaced frangible parts at least one of which is destroyed during rotation of the closure cap relative to the container body toward said release position in either direction of rotation.

4,457,438

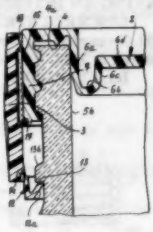
TAMPERPROOF CLOSURE

Hubert Varlet, Paris, and Aurel Catalogna, Aulnay-sous-Bois, both of France, assignors to Boussois Souchon Neuvesel Gervais Danone, Paris, France

Filed Mar. 29, 1983, Ser. No. 480,115
Claims priority, application France, Mar. 31, 1982, 82 05891
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—252 **12 Claims**

1. A tamperproof closure for the mouth of a container provided with a neck surrounding this mouth and formed with an external shoulder, said closure comprising:

a cap formed from synthetic resin and of cup-shaped configuration, said cup being provided at the bottom with means sealingly engaging said neck at said mouth, and an outer member connected to said bottom surrounding said neck, said neck and said outer member being provided with formations for releasably engaging said outer member and said neck, said member being formed externally with an annular array of ribs; and



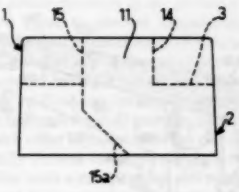
a sleeve surrounding said outer member and said neck, said sleeve being generally cylindrical and formed of synthetic resin while being provided at a lower end with a safety ring connected by at least one frangible ligature to said sleeve, said ring being engageable by said shoulder of said neck for separation of said ring from said sleeve upon removal of said cap from said container, said sleeve being formed with an annular array of grooves complementary to and receiving said ribs, and with inwardly directed shoulders flanking said ribs and axially coupling said cap to said sleeve.

4,457,439

TAMPERPROOF CLOSURE MADE OF PLASTICS MATERIAL

Jacques Obadia, Paris, France, assignor to Rical S.A., Longvic, France

Filed Mar. 2, 1983, Ser. No. 471,497
Claims priority, application France, Mar. 9, 1982, 82 03968
Int. Cl.³ B65D *41/48*
U.S. Cl. 215—256 **8 Claims**



1. A tamperproof closure for bottles comprising an external ring round their neck, this closure comprising a plastics material stopper provided with a top intended to be applied against the end face of the neck, said top having neck contact portions, an upper outer edge raised above the neck contact portions, a bottom outer edge, and an outer side wall, and a sealing part projecting downwards from the said top and designed to be pushed by force into the neck to engage against the inside surface of this neck, and tearable means for engaging, before the first opening of the bottle to be closed, with the said ring to retain the stopper on the neck in tamperproof fashion, the said tearable means comprising an annular guarantee strip made in one piece with the stopper, continuing the outer side wall of

the top of the stopper downwards, having an inner bead hooking onto the said neck ring and comprising a tongue extending upwards up to the level of the upper outer edge of the top forming a segment of the outer side wall of the top, the said strip being joined to the bottom outer edge of the top of the stopper by a tear line and the said tongue being joined to the outer side wall of the top of the stopper by two tear lines one of which is continued downwards across the guarantee strip.

4,457,440

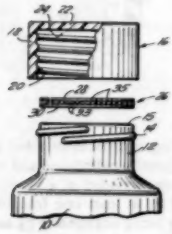
CAP LINER HAVING AN INTERMEDIATE LAYER OF DISCRETE STRIPS

Joseph Dukess, 708 Greenwich St., New York, N.Y. 10014

Filed Jul. 6, 1982, Ser. No. 395,539

Int. Cl.³ B65D *41/12*

U.S. Cl. 215—347 **6 Claims**



1. A cap liner comprising a disc having at least one outer layer and an intermediate layer bonded to said outer layer, said outer layer being relatively thin and non-resilient, said intermediate layer including a plurality of discrete spaced strips and being resilient, compressible, and relatively thick, said strips, when the liner is uncompressed, being completely separate from each other and unconnected to each other except by said outer layer.

4,457,441

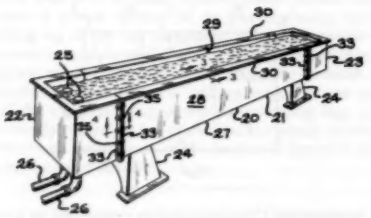
TANK ASSEMBLY

Dexter C. McCloughan, Clark Lake, Mich., assignor to Frigid Units, Inc., Toledo, Ohio

Filed Jun. 30, 1982, Ser. No. 393,650

Int. Cl.³ B65D *6/02, 6/10, 6/34*

U.S. Cl. 220—5 A **4 Claims**



1. A tank assembly comprising at least one longitudinally extending channel module, said channel module including a bottom member and opposed side members extending upwardly from said bottom member, said bottom members and said opposed side members comprise multiple layers, said multiple layers substantially comprising an inner gel coat layer, a fibrous glass layer, an inward foamed insulation layer, an intermediate fibrous glass layer, an outward layer of wood and an outer fibrous glass layer;

a flange member extending outwardly from the top of said opposed side members, said flange member being substantially comprised of said outer gel layer and said fibrous glass layer;

a reinforcing member positioned within each of said flange members, said reinforcing member substantially comprising a metal strip encapsulated within said flange members, said reinforcing member being in a spaced apart relationship with said foamed insulation layer and said wood layer;

a connecting module positioned at the end of said longitudinally extending channel module, said connecting module including a bottom member and opposed side members extending upwardly from said bottom members, said side members being substantially parallel; and,

a fastening means for removeably connecting said channel module to said connector modules, said fastening means comprising fastening flanges on the ends of said channel module and said connector modules, and bolt assemblies for connecting abutting fastening flanges.

4,457,442

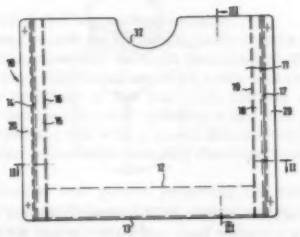
WIRING DIAGRAM POCKET FOR A SWITCHBOARD CABINET

Jurgen Laudt, Franzosenweg, Fed. Rep. of Germany, assignor to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 401,349

Int. Cl.³ B65D *25/24*

U.S. Cl. 220—18 **10 Claims**



1. A wiring diagram pocket for a switchboard cabinet, comprising a panel which is bent along its two vertical sides and its bottom edge at multiple right angles and in the bent regions is provided with elongated abutting sections parallel with and spaced from the panel by transitional portions for the purpose of abutting an adjacent supporting surface, characterized in that parallel fastening members **(21, 22)** are combined with a center portion **(25)** to form a U-section **(20)** the middle portion of which is welded to the exterior of said transitional portion **(14, 17)** on each vertical side of said panel **(11)** disposed perpendicularly on the exterior side of said transitional portions **(14, 17)** extending vertically to said panel **(11)**, and that said fastening members **(21, 22)** are spaced at different distances from said abutting sections **(12, 15, 18)** and provided with holes **(23, 24)** at predetermined intervals in alignment with each other, the diameter of holes **(24)** in said fastening member **(22)** closer to said panel **(11)** are larger than the diameter of holes **(23)** in said fastening member **(22)** closer to said abutment sections **(12, 15, 18)**.

4,457,443

MOTOR VEHICLE FUEL TANK VENTING DEVICE

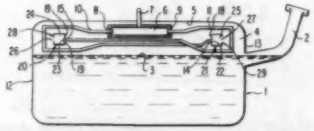
Manfred Casimir, Esslingen; Wolf-Dieter Kurz, Stuttgart, and Manfred Distel, Ostfildern, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 383,185

Claims priority, application Fed. Rep. of Germany, May 30, 1981, 3121621

Int. Cl.³ B65D *25/00, 90/34;* F16K *24/00;* B60K *15/02*

U.S. Cl. 220—85 S 4 Claims



1. A venting device for fuel tanks of vehicles, the venting device including an equalizing chamber means disposed in the fuel tank at a position below a top wall thereof and generally centrally with respect to side walls of the fuel tank, means for venting the equalizing chamber means to the atmosphere, a plurality of vent line means disposed in the fuel tank interior, each of the plurality of vent line means including a first end and a second end, the first end of each of said plurality of vent line means terminating at approximately the same height relative to opposed walls of the equalizing chamber means, the second end of each of the plurality of vent line means terminating generally proximate respective opposite side walls of the fuel tank, a plurality of end chamber means corresponding in number to the number of vent line means disposed in the fuel tank interior, the second end of each of the plurality of vent line means having an end chamber means associated therewith, each of the end chamber means including opening means for venting the respective end chamber means to the fuel tank interior and means for receiving the respective second end of the respective vent line means, the opening means for venting including a single chamber opening provided in a distal end wall of the respective end chamber means opposite a wall having the means for receiving the second end of a respective vent line means, said opening means and means for receiving of each end chamber means being spaced with respect to the juncture of a continuous wall means joining the distal end wall and the opposite wall.

4,457,444

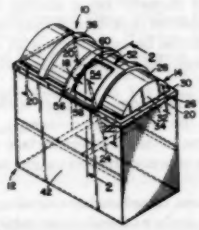
COMBINE HOPPER COVER

Allan N. Wold, Roseau, Minn., assignor to DAT Agri-Products, Inc., Fargo, N. Dak.

Filed Feb. 15, 1983, Ser. No. 466,673

Int. Cl.³ B65D *51/12*

U.S. Cl. 220—213 5 Claims



1. A cover for a combine hopper, said hopper having sidewalls defining an open top, said cover comprising:

an integral covering member including flange means for mating with the top of said sidewalls, said member including an arcuately shaped sheet between opposite first sides of said flange means, said member including substantially flat ends extending between said sheet and each second side of said flange means, said sheet having a plurality of raised ribs with an opening between a pair of said ribs;

a door for covering said opening, said door having a flange portion with a pair of opposite sides riding on said pair of ribs, said door having a recessed portion extending between said pair of ribs to provide shoulders where said recessed portion meets said flange portion, said shoulders providing guide surfaces for sliding said door along said ribs;

a plurality of first straps for holding said member to said hopper;

a second strap for holding said door to said covering member;

first means for attaching each of said first straps to said member;

second means for attaching said second strap to said door; and

third means for attaching each of said first and second straps to said hopper;

whereby said covering member is held to said hopper and said door is slideably held to said covering member.

4,457,445

VALVE CAP TAMPER-PROOF COVER

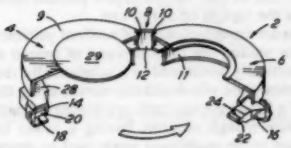
Robert S. Hanks, Thrussington, and Philip H. Brodrick, Long Whatton, both of England, assignors to P.M. Plasmatic (Leicester) Limited, Leicester, England

Filed Jul. 27, 1983, Ser. No. 517,752

Claims priority, application United Kingdom, Aug. 7, 1982, 8222827

Int. Cl.³ B65D *53/00, 55/02*

U.S. Cl. 220—214 5 Claims



1. A valve cap device covering in use at least a portion of a fluid flow control valve to prevent unauthorised operation thereof, comprising a shell member adapted to conform at least approximately to the contours of the valve portion to be covered, said shell member having a parting line having a first end and a second end, said parting line extending transversely of the shell member to form two shell portions, said shell portions being linked to each other adjacent said first end of said parting line by an integrally formed hinge portion, wherein said shell member is provided with a co-operating non-releasable fastening means adjacent said second end of said parting line and arranged to hold the two shell portions together in use to form the shell member, and wherein the hinge portion comprises a tear-strip.

4,457,446

VAPOR CLOSURE FOR FLEXURES IN FLOATING

Robert A. Bruening, Naperville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jan. 26, 1982, Ser. No. 342,789

Int. Cl.³ B65D *88/46*

U.S. Cl. 220—224 2 Claims

1. In a liquid storage tank having a floating roof with a

circular rim, a substantially ring-like vertical cylindrical shoe adapted to slide along the inside wall surface of the tank outwardly from the roof rim, means by which the shoe is supported by the roof, a primary flexible seal extending from the roof rim to the shoe with the primary flexible seal having an outer longitudinal edge tightly clamped to the shoe, and with said shoe containing a plurality of vertically positioned spaced apart flexures in the form of open ended troughs which terminate below the shoe top edge and each with a longitudinal opening substantially flat against the tank wall, the improvement comprising:

a flexure trough closure of resilient polymeric material with a lower body portion inside the open top end of a substantial number of the flexure troughs, with said lower body portion being in contact with the flexure trough;

the flexure trough closure having a thin flat sheet upper portion, wider than the flexure trough, placed against the shoe inside surface and tightly clamped between the primary flexible seal outer longitudinal edge and the shoe inside surface; and

the flexure trough closure lower body portion having an upper end which slopes upwardly from the front to the back of the lower body portion and merges unitarily with the thin flat upper portion, with said thin flat sheet portion having a lower edge located near the top of the sloped upper end so that the thin sheet portion remains entirely above the trough open top end.

2. A flexure trough closure of resilient polymeric material, adapted for sealing the open top end of spaced apart flexure troughs vertically positioned in a substantially ring-like vertical cylindrical shoe which slidably moves along the inside wall surface of a liquid storage tank containing a floating roof;

the flexure trough closures having a lower body portion adapted to be positioned inside and in contact with the open top end of the flexure troughs and a thin flat upper sheet portion capable of being placed by the shoe inside surface;

the lower body portion having an upper end which slopes upwardly from the front to the back of the body portion and merges unitarily with a thin flat sheet portion extending upwardly from the body portion, with said thin flat sheet portion having a lower edge located near the top of the sloped upper end so that in use the thin sheet portion remains entirely above the trough open top.

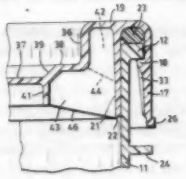
4,457,447

PLASTIC PAIL AND LID

Peter G. Kirkis, Toronto, Canada, assignor to Vulcan Industrial Packaging Limited, Toronto, Canada

Filed Apr. 6, 1983, Ser. No. 482,500
Int. Cl.³ B65D *41/16, 41/18*
U.S. Cl. 220—306 **15 Claims**

11. A molded plastic pail having an annular side wall tapering downwardly from its upper edge to a circular bottom edge of reduced diameter, a generally circular lid having a continuous annular downwardly-turned peripheral rim engaging the outer side of the upper edge of the side wall, an upper annular lid portion extending over the upper edge of the side wall to a downwardly turned annular inner wall of a diameter to snugly receive the bottom edge of a similar pail when stacked thereon and connecting with a central portion of the lid recessed downwardly with respect to said upper annular lid portion, the latter being formed integrally on its underside with a downwardly extending annular flange having a lower edge disposed inwardly of the pail side wall, and a plurality of radially extending ribs bridging between the inner side of the downwardly extending flange and the underside of a portion of the lid disposed radially inwardly therefrom, each of said ribs having a lower edge which inclines upwardly and inwardly toward said portion of the lid.

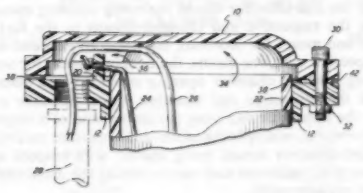


4,457,448

GASKETLESS WELL CASING CAP

Joseph L. Beagell, Box 10, Harpursville, N.Y. 13787

Filed Mar. 21, 1983, Ser. No. 477,092
Int. Cl.³ B65D *45/00*
U.S. Cl. 220—327 **8 Claims**



1. A cap for installation on the upper end of a cylindrical well casing having an outer first diameter in sealing engagement therewith, said cap comprising, in combination:

(a) a lower section having a first opening therethrough bounded by a generally cylindrical surface, tapering outwardly from a second diameter at one end to a third diameter at the other end;

(b) said third diameter being larger than said first diameter and said second diameter being smaller than said first diameter by an amount permitting manual forced insertion of said lower section on said casing with said other end downward and said casing extending entirely through said lower section;

(c) said lower section having an upper surface lying in a plane normal to the axis of said opening;

(d) an upper section having a lower surface surrounding a recessed portion of predetermined outline larger than said first diameter;

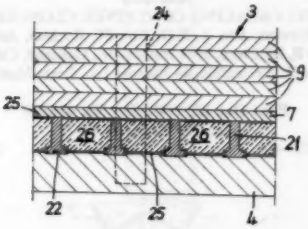
(e) a lip of continuous, closed outline extending downwardly from said lower surface of said upper section and having a terminal edge lying in a substantially flat plane; and

(f) means tightly joining said upper and lower sections in predetermined relation with said lip completely surrounding said first opening and in sealing engagement with said upper surface of said lower section.

4,457,449
PRESSURE TANK FOR HOT FLUIDS OR AGENTS

Friedhelm Bohlander, and Heinrich Rywalski, both of Essen, Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 119,101, Feb. 6, 1980, abandoned. This application Jun. 1, 1982, Ser. No. 383,937
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1979, 2905593
Int. Cl.³ B65D *8/06, 25/20*
U.S. Cl. 220—445 3 Claims



1. In a pressure tank suitable for exothermic processes carried out in a range of between about 400° and about 500° C. for hydrogenation processes, a tank wall comprising in combination:

an inner layer of chrome-molybdenum steel having an inner surface facing the process and an outer surface with flat grooves therein;

a layer of thermal insulation comprising rock wool sandwiched between first and second sheets of aluminum foil, the first sheet of which is disposed in abutment with the outer surface of the layer of chrome-molybdenum steel;

a plurality of steel webs disposed in spaced relation around the wall, each web having a base portion and rib portion with an exposed end and being T-shaped in cross-section, the webs extending through the layer of thermal insulation and sheets of aluminum foil with the bases seated in the grooves in the outer surface of the layer of chrome-molybdenum steel;

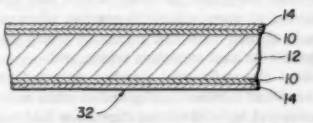
a layer of high temperature-resistant steel in abutment with the second layer of aluminum foil and the exposed ends of the ribs, the layer of high temperature-resistant steel being substantially thinner than the inner chrome-molybdenum steel layer, and

a plurality of reinforcing layers of fine-grained structural steel surrounding the high temperature steel layer.

4,457,450
NICKEL-ZINC ALLOY COATED DRAWN AND IRONED CAN

John R. Smith, Richmond, Ohio; William D. Bingle, Rochester, Pa., and Lowell W. Austin, Weirton, W. Va., assignors to National Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 233,569, Feb. 11, 1981, Pat. No. 4,374,902. This application Sep. 30, 1982, Ser. No. 430,956
Int. Cl.³ B65D *1/12*
U.S. Cl. 220—455 6 Claims



1. A nickel-zinc alloy plated steel can comprising,

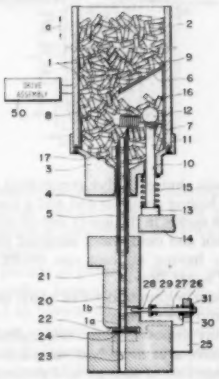
a bottom wall and a seamless sidewall, said bottom and sidewalls being integrally formed by a drawing and ironing process whereby the sidewalls is ironed to a thickness substantially less than that of the bottom wall,

said can being drawn and ironed from a flat rolled steel sheet having a nickel-zinc alloy coating plated on each side thereof, the nickel-zinc coating having a thickness within the range of about 0.5 to about 5 microinches before being drawn and ironed, and the amount of zinc in the coating being within the range of about 2 to about 12 percent by weight.

4,457,451
APPARATUS FOR FEEDING ELECTRIC CIRCUIT ELEMENTS

Iwao Ichikawa, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 304,168
Claims priority, application Japan, Sep. 29, 1980, 55-138650[U] Dec. 29, 1980, 55-188038; Dec. 29, 1980, 55-188040
Int. Cl.³ B65G *59/06;* B65D *83/02*
U.S. Cl. 221—190 4 Claims



1. An apparatus for feeding electric circuit elements comprising:

a hopper for accommodating a supply of said electric circuit elements and having a bottom with a bore extending therethrough;

capture means extending through said bore and including a substantially vertical tube;

one of said hopper and said capture means being movable relative to the other in the direction of the axis of said bore so that said electric circuit elements in the hopper are captured one at a time by said capture means and fed thereby through said bore to a predetermined position;

a separating plate disposed above said capture means in said hopper and inclined downwardly from the side if said hopper which is opposite to said one side and extending across only a portion of the cross-section of said hopper extending from said opposite side, for shielding the electric circuit elements under said separating plate from at least part of the weight of the electric circuit elements thereabove, said vertical tube terminating within said hopper below said separating plate is an oblique end edge so as to define an opening for receiving the electric circuit elements, which opening is directed laterally toward one side of the hopper; and

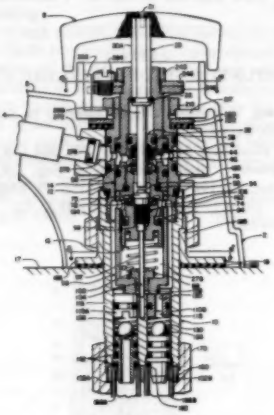
at least one rod extending substantially parallel to said tube through said bottom of the hopper and located under said separating plate, said rod and said hopper also being movable relative to each other upon the relative movement of said hopper and said capture means for disrupting any jams of the electric circuit elements that would interfere with the smooth feeding thereof into said tube.

4,457,452

AUTOMATIC SHUT-OFF VALVE

Paul C. Symmons, Wellesley, Mass., assignor to Symmons Industries, Inc., Braintree, Mass.

Filed May 24, 1982, Ser. No. 381,147
Int. Cl.³ B67D *5/30*; F16K *11/18*
U.S. Cl. 222—20 **24 Claims**



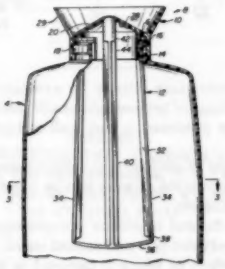
1. An automatic shut-off valve comprising in combination:
a valve body having an upper end and a lower end, first and second inlet means in the lower end of said valve body for receiving hot and cold water supplied to said valve, said valve body having at least one outlet through which discharged water flows;
a piston cylinder within said valve body, said cylinder having upper and lower ends;
a piston slidably disposed within said cylinder and having a larger effective area at its bottom end than its top end;
a spring arranged so as to urge said piston upward;
a first passageway for leading hot and cold water from said inlet means to a first volume of said cylinder above said piston;
a second passageway for leading hot and cold water from said inlet means to a second volume of said cylinder below said piston, said second passageway being arranged so that the rate of water flow into said second volume is a fraction of the rate of water flow via said first passageway into said first volume;
a third passageway for passing water from said second volume to said first volume around said piston;
means on said piston for substantially preventing flow of water from said second volume to said first volume via said third passageway when said piston is moving up in said cylinder;
a valve opening for passing mixed water from said first volume to said at least one outlet;
a valve seat in the upper end of said piston cylinder surrounding said valve opening;
a valve closure member attached to the upper portion of said piston in position to engage said valve seat when said piston moves upwardly in said piston cylinder;
a stem slidably attached to said valve body and arranged to engage and push said valve closure member down so as to open said valve opening;
a valve operating handle attached to said stem to facilitate pushing said stem downward so as to open said valve opening; and
adjustable valve means between said first and second inlet means and said cylinder for varying the proportion of hot and cold water delivered from said first and second inlet means to said first volume via said first passageway, whereby to control the temperature of mixed water discharged via said at least one outlet.

4,457,453

SELF-SEALING CONTAINER CLOSURE

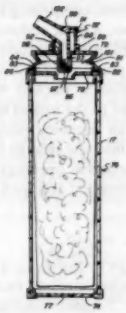
Peter P. Stevens, Rte. 1, P.O. Box 56, Cochise, Ariz. 85606; Thomas R. McClure, 5954 Balboa Dr., Oakland, Calif. 94611, and Ann H. Firstenfeld, 44 Estrada La., Corte Madera, Calif. 94925

Filed Oct. 22, 1982, Ser. No. 436,087
Int. Cl.³ B65D *37/00*
U.S. Cl. 222—48 **20 Claims**



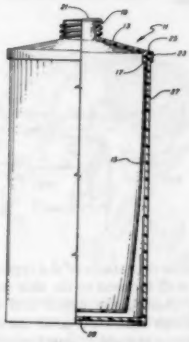
1. A self-sealing liquid container assembly comprising:
a squeezable container having an other-than-round cross-sectional shape and a circular mouth, said container having minimum and maximum widths;
a cap mounted for rotary movement to said mouth, said cap having a valve seat defining an outlet opening;
a valve assembly means for sealing said outlet opening comprising:
a valve element configured for sealable engagement with said valve seat;
an elongate valve stem having a first end attached to said valve element and a second end;
a valve spring mounted to the second end of said valve stem; and
means, coupled to spaced-apart points on said spring, for deflecting said spring to bias said valve element against said valve seat, said deflecting means including a pair of elongate arms positioned on each side of the stem and configured to further deflect said spring to withdraw said valve element from said valve seat when at least one said arm is deflected toward said valve stem;
means for coupling said cap and said deflecting means so rotary movement of said cap causes like rotary movement of said deflecting means, whereby when said container is squeezed along said minimum which said arm portion is deflected to open said outlet opening when said arm portion is aligned with said minimum width but not when aligned with said maximum width; and
a resilient circumferential member mounted to said arms, said resilient member configured so when said container is squeezed along said second dimension said resilient member is deflected to urge said valve element toward said valve seat when said arm portion is aligned with said first dimension but not when aligned with said second dimension.

4,457,454
TWO-COMPARTMENT DISPENSER
Philip Meshberg, 2500 S. Ocean Blvd., Palm Beach, Fla. 33480
Filed Oct. 26, 1981, Ser. No. 315,243
Int. Cl.³ B65D 37/00
U.S. Cl. 222—95 4 Claims



1. A dispenser for fluent material, said dispenser comprising:
a collapsible container having a flexible wall impervious to air and enclosing a primary compartment to hold the fluent material, the wall having an opening therethrough;
a vented outer case enclosing the collapsible container within a space open to the surrounding environment;
a compartment separator in sealing contact with the perimeter of the opening and mechanically connected to the vented case;
a cover of fluid-tight material extending over at least a part of the compartment separator means and the perimeter of said cover sealed fluid-tight thereto and defining therewith a secondary compartment between the cover and the compartment separator, including a disk which is movable inwardly toward the secondary compartment and outwardly away from the secondary compartment;
resilient means biasing the movable part of the cover away from the compartment separator;
a passage through the compartment separator to allow the fluent material to pass therethrough from the primary compartment to the secondary compartment;
a nozzle communicating with the secondary compartment to allow the fluent material to emerge from the secondary compartment through the nozzle in response to inward movement of the movable part;
valve means mounted on said disk responsive to inward movement of the cover to close the passage to prevent the fluent material from passing from the secondary compartment back into the primary compartment in response to inward movement of the movable part, comprising a piston aligned with the passage to seal the passage when the movable part of the cover is pressed toward the compartment separator, the normal position of the movable part of the cover holding the piston resiliently spaced from the compartment separator means;
a channel for the fluent material through the piston, the movable part of the cover encircling the piston at a region of the piston remote from the compartment separator, the channel having an entrance to the secondary compartment adjacent the part of the piston encircled by the movable part of the cover, whereby a substantial part of the piston can enter and seal the passage through the compartment separator without blocking the entrance to the channel; and
an actuator comprising a hollow tube connected to the nozzle to allow the fluent material to pass through the hollow tube to the nozzle, said hollow tube extending through said disk to communicate with the secondary compartment and being rotatably coupled to said disk to rotate with respect thereto, said hollow tube comprising an aperture alignable with the channel to open and close the channel selectively according to the rotational position of the hollow tube with respect to the disk.

4,457,455
COLLAPSIBLE CONTAINER
Philip Meshberg, 2500 S. Ocean Blvd., Palm Beach, Fla. 33480
Filed Oct. 13, 1981, Ser. No. 310,987
Int. Cl.³ B65D 35/14
U.S. Cl. 222—105 11 Claims



3. A collapsible container which is adapted to be filled and transported without the need for a rigid supporting outer container and which is adapted for use with a pump or other dispenser comprising:
a. a rigid top portion of generally annular shape including an axially extending central neck portion with an opening therein, and an outwardly extending flange portion;
b. a flexible bag extending axially inwardly from said rigid portion, radially inward of said flange whereby said flange can be rested on a solid support during filling;
c. a seal sealing off said opening in said neck;
d. a pump disposed in mounting means, said mounting means mounted onto said neck, said pump including a pump chamber terminating in an inner wall having an inlet opening therein, and a dispensing stem extending through said pump chamber to said opening, said dispensing stem being pointed at its inner end, said inner end of said chamber being disposed adjacent said seal, whereby, upon actuation of said pump stem, said seal will be broken to permit dispensing;
e. an actuator on the axial outer end of said dispensing stem; and
f. a trigger spray attachment to convert radial motion to axial motion attached to said mounting means and pump and operably connected to said actuator to convert a radial movement by an operator into axial movement of said actuator including:
i. a pistol grip handle;
ii. a first arm extending from said pistol grip handle having on the end thereof a hollow cylindrical member, said cylindrical member surrounding and in close abutment with said mounting means;
iii. a second arm extending from said pistol grip to a location above said actuator; and
iv. a 90° angular portion hinged to said pistol grip intermediate said first and second arms having a first leg contacting said actuator and a second leg spaced from said piston grip when said actuator is full outward, whereby movement of said second leg toward said pistol grip will act to move said actuator inwardly.

4,457,456

COLLAPSIBLE RECEPTACLE WITH STATIC ELECTRIC CHARGE ELIMINATION

Norwin C. Derby, and Robert R. Williamson, both of Dallas, Tex., assignors to Super Sack Manufacturing Company, Dallas, Tex.

Continuation-in-part of Ser. No. 336,455, Dec. 31, 1981, which is a continuation-in-part of Ser. No. 281,406, Jul. 8, 1981, abandoned, which is a continuation of Ser. No. 046,822, Jun. 8, 1979, abandoned. This application Jul. 30, 1982, Ser. No. 403,811

Int. Cl.³ B65D *33/38*

U.S. Cl. 222—105 **6 Claims**

1. In a collapsible receptacle of the type comprising a tubular side wall, a top wall secured to the side wall around the upper end thereof for closing the upper end of the receptacle, a plurality of lift loops each secured to the side wall and extending upwardly above the upper end thereof for supporting the receptacle and the contents thereof, and a bottom wall secured to the side wall around a lower end thereof for closing the lower end of the receptacle, the improvement comprising:

a rectangular discharge spout blank having an outer layer and an electrically conductive inner layer;

means securing the discharge spout blank adjacent opposite edges thereof so that the blank is formed into a tubular configuration with a first portion of said inner layer located on the inside of said configuration, and a second portion of said inner layer extending beyond said securing means to expose said inner layer, said tubular configuration forming a discharge spout mounted in the bottom wall of the receptacle;

said discharge spout being normally closed for containing the contents of the receptacle therewithin and being selectively openable to release the contents of the receptacle to flow outwardly through the discharge spout so that upon release at least a portion of the receptacle contents engage the electrically conductive inner layer of the discharge spout; and

means for connecting the second portion of said electrically conductive inner layer of the discharge spout to a source of predetermined electric potential and thereby controlling the buildup of static electricity in the contents of the receptacle upon release thereof through the discharge spout.

4,457,457

APPARATUS FOR DISPENSING THERMOPLASTIC MATERIAL

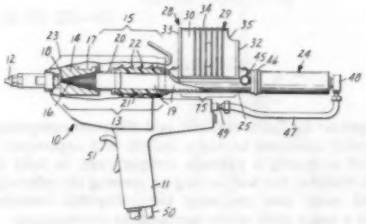
Michael M. Dziki, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 27, 1982, Ser. No. 343,304

Int. Cl.³ B05C *1/00*

U.S. Cl. 222—146 HE **1 Claim**

1. A portable thermoplastic material-dispensing apparatus of the type wherein shaped, solid members of thermoplastic material are converted from a solid to a melted state in a heated well and the molten thermoplastic material is dispensed from said apparatus by piston means housed in a piston chamber adjacent said heated well, the improvement comprising a loading chamber situated between said heated well and said piston chamber, and a manually retractable piston, said loading chamber comprising an intermediate barrel section and a magazine, said intermediate barrel section comprising wall members defining a barrel chamber in axial alignment with said heated well, said barrel chamber being dimensioned to receive a single, shaped, solid member of thermoplastic material and allow passage therethrough to said heated well, said magazine being situated above said barrel chamber, comprising two sidewall members, a front endwall member, a back endwall member, and a top-wall member which define and substantially enclose a storage chamber for storing a plurality of said shaped, solid members of thermoplastic material in stacked relationship with their longitudinal axis paraliel to the axis of said barrel section, said magazine comprising an entrance port for introducing said shaped, solid members into said storage chamber, said entrance port being defined by adjacent openings in said top wall member, said sidewall members and said back endwall member, said



back endwall member being of such a height that it extends above the bottom of the uppermost shaped, solid member when said storage chamber is filled with shaped, solid members, said entrance port permitting convenient placement and removal of shaped, solid members therein and therefrom while permitting said apparatus to be tilted without the loss of shaped, solid members from said magazine, and said wall members further defining an exit port communicating with said barrel chamber, said exit port being positioned and dimensioned to permit one of said shaped, solid members to pass therethrough into said barrel chamber in axial alignment with the axis of said barrel section, and said retractable piston comprising a retract lever which permits the piston to be manually retracted to within said piston chamber such that a shaped, solid member contained in said storage chamber may fall by gravity feed into said barrel chamber when said barrel chamber is empty.

4,457,458

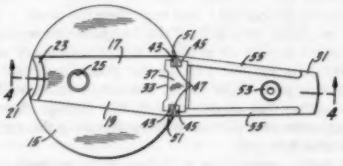
DISPENSING CAP

Alois R. Heinol, Bensenville, Ill., assignor to Knight Engineering & Molding Co., Arlington Heights, Ill.

Filed Nov. 15, 1982, Ser. No. 441,481

Int. Cl.³ B65D *25/40, 43/24*

U.S. Cl. 222—498 **4 Claims**



1. A dispensing cap for a container including:

a tubular body of circular transverse cross section,

a wall closing the top end of the tubular body,

an upwardly opening slot formed in the top end wall and

extending across the tubular body with a generally flat wall forming the bottom of the slot,

an aperture extending through the bottom of the slot into an area surrounded by the tubular body,

a hinge assembly located in the slot and including an upstanding member formed on the flat bottom wall of the slot at a location inwardly of the circular perimeter of the tubular body,

a flap integrally connected to the upstanding member of the hinge assembly by a strap,

a portion of reduced thickness formed in the strap to create a hinge at the juncture of the strap and the upstanding member to permit the flap to swing into and out of the slot to close and open the aperture into the tubular body,

the portion of reduced thickness of the strap formed by an inclined slot cut in the tubular body near the top end wall and extending into the upstanding member.

4,457,459

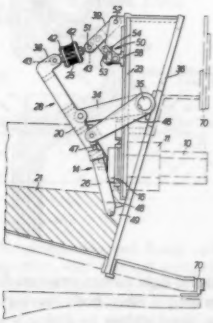
VALVE SUITABLE FOR CONTROLLING TEEMING FROM FURNACE TAPHOLES

Kenneth W. Bates, Calow; William A. Griffiths, Newbold, and Norman H. Watts, Dore, all of England, assignors to USS Engineers and Consultants, Inc., Pittsburgh, Pa.

Filed Apr. 22, 1982, Ser. No. 370,716

Int. Cl.³ B22D *41/00*

U.S. Cl. 222—599 **11 Claims**



1. A valve mechanism for controlling metal flow from a furnace taphole, comprising an orificed stationary valve plate, a companion slideable valve plate for covering or exposing the orifice of the former to close or open the valve to flow, an actuating member for moving the slide plate which extends obliquely thereto and is by a biased spring means acting thereon to press said slide plate to the stationary plate, and means guiding the actuating member for displacement along a predetermined path wherein a portion of the actuating member engaging the slide plate moves in a plane parallel to the contacting faces of the valve plates.

4,457,460

WRISTWATCH STRAP WITH PROTECTIVE LAYER THAT CONTACTS THE WRIST

Hermann Hirsch, Klagenfurt, and Reinhart Jarisch, Vienna, both of Austria, assignors to Hermann Hirsch Leder- und Kunststoffwarenfabrik, Klagenfurt, Austria

Continuation of Ser. No. 258,003, Apr. 27, 1981, abandoned. This application Jan. 28, 1983, Ser. No. 461,928

Claims priority, application Austria, Nov. 3, 1980, 5400/80

Int. Cl.³ A45C *11/10*; B32B *1/04*

U.S. Cl. 224—178 **6 Claims**

1. A flexible wristwatch strap of leather or the like, having a continuous nonporous barrier layer on the surfaces of the wristwatch strap that contact the wrist of the wearer, said barrier layer consisting of metal particles embedded in a matrix which consists of a synthetic resin.

4,457,461

HEAD MOUNTING APPARATUS

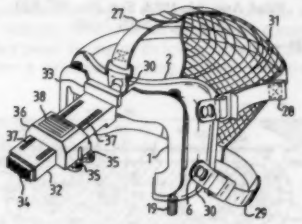
Paul A. J. Docking, Clwyd, Wales, and Michael H. Glynn, Basingstoke, England, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,413

Claims priority, application United Kingdom, Sep. 24, 1981, 8128905

Int. Cl.³ A45C *1/04*

U.S. Cl. 224—181 **17 Claims**



1. Head mounting apparatus comprising a substantially rigid member for supporting equipment to be used by a wearer, a flexible member which can flex to adapt to the head of the wearer, and pivotal means involving two spaced substantially parallel pivotal axes each directly connecting the flexible member to the substantially rigid member.

4,457,462

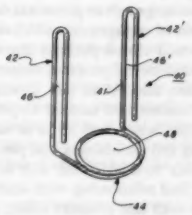
TOOL HOLDER

Umberto C. Taormina, 10 Pinewood Ave., West Long Branch, N.J. 07764

Filed Aug. 26, 1981, Ser. No. 296,551

Int. Cl.³ G01C *15/10*

U.S. Cl. 224—269 **6 Claims**



1. A tool holder for supporting a tool, said tool holder being supported by the belt of a worker, comprising:

a predetermined length of a predetermined metal;

said length of metal having respective end portions and an intermediate portion;

each of said end portions formed into a generally inverted U-shaped member, said pair of U-shaped members being spaced apart and aligned, said U-shaped members adapted to being oriented generally horizontally and for receiving said belt through each of said U-shaped members whereby said tool holder is supported by said belt; and

said intermediate portion extending substantially perpendicular to said end portions and formed into a generally convoluted configuration to provide a substantially circular-shaped member, said circular-shaped member lying in a plane substantially perpendicular to the respective planes in which said U-shaped members lie, said interme-

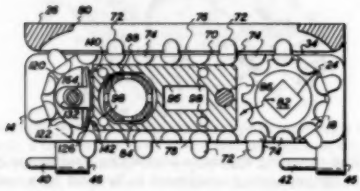
diate portion including first and second end sections spaced from the open ends of said respective U-shaped members so that said first and second end sections operate to retain said belt within said respective U-shaped members, and said generally circular-shaped member being disposed for receiving said tool whereby said tool holder supports said tool.

4,457,463

TRACTOR APPARATUS

Leo J. Hubbard; Raymond P. Hubbard, and Erwin J. Strobel, all of Rio Grande, P.R., assignors to P.H.D. of Puerto Rico, Inc., Fajardo, P.R.

Filed Aug. 11, 1982, Ser. No. 407,020
Int. Cl.³ G03B *1/30*
U.S. Cl. 226—74 **41 Claims**



1. A combined tractor and friction web feed mechanism which comprises a frame, a sprocket journaled in said frame, a belt having web drive elements movably mounted on said frame and entrained on said sprocket, web support means presenting a web support surface adjacent to and parallel with the surface of said belt, a pressure roller in axial alignment with said sprocket and in alignment with said support surface, a lid hinged to said frame and pivotal about a hinge axis toward and away from a closed position directly above said belt, a latch mounted on said frame and pivotal about an axis spaced from and parallel to the axis on which said lid is hinged, said latch having a detent thereon, said lid having a catch movable into and out of engagement with said latch detent when said lid is pivoted about said hinge axis to pivot said detent and bring said catch into and out of engagement with said detent when said lid is pivoted to said closed position directly above said belt and away from said closed position, respectively, whereby to releasably maintain said lid in said closed position, a pinch roller yieldably mounted on said lid to press the web against said pressure roller when said lid is in said closed position, means for moving and maintaining said pinch roller away from said pressure roller to enable said web to be engaged selectively in tractor feed relationship with said belt and in friction feed relationship with said pressure roller, a member movably mounted between said frame and said support surface, and means for moving said member into a position to present a surface for engaging an edge of said web to guide said web for friction feed and out of said last named position to enable said web to be engaged in tractor feed relationship with said belt.

4,457,464

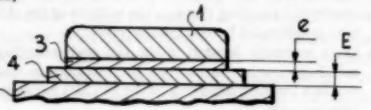
METHOD OF FIXING A FERRITE TO A METAL PIECE

Gérard Forterre, and Pierre Hartemann, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 7, 1982, Ser. No. 337,614
Claims priority, application France, Jan. 13, 1981, 81 00472
Int. Cl.³ H01P *11/00*
U.S. Cl. 228—124 **8 Claims**

1. A method of fixing a ferrite to a metal piece for a high-power microwave device, comprising the following steps:

deposit of a nonresistive metal on the face of the ferrite to be fixed;



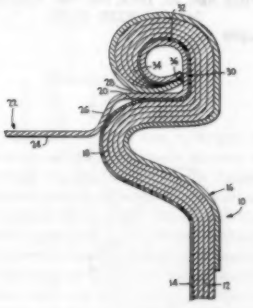
bonding of the metallized face of said ferrite to the metal piece by means of a heat-conducting adhesive.

4,457,465

GAS AND LIQUID TIGHT CORNER STRUCTURE FOR A FIBRE SHIPPING CONTAINER

John K. Shepard, Bolingbrook, and Walter R. Wagonseller, Naperville, both of Ill., assignors to Continental Fibre Drum, Inc., Stamford, Conn.

Filed Sep. 30, 1982, Ser. No. 432,037
Int. Cl.³ B65D *7/42*
U.S. Cl. 229—5.6 **6 Claims**



1. A gas and liquid tight corner structure for a fibre shipping container comprising a fibre body having at least one end reinforced by a metal chime to define a radially inwardly directed bead which in part defines an axially outwardly facing shoulder, an end unit having an outer periphery seated on said shoulder and terminating in an outer sealing rim, and a terminal end portion of said fibre body and said chime being curled radially inwardly and generally wrapped around said sealing rim; said corner structure being improved by said sealing rim being resiliently compressible in the forming of said corner structure to resiliently compressibly engage said wrapped around portions of said fibre drum and said chime.

4,457,466

MASK FOR PROTECTING TAB CONTACTS OF CIRCUIT BOARDS

Joseph Ahmann, Willowbrook, and James J. Grammas, Westchester, both of Ill., assignors to GTE Automatic Electric Inc., Northlake, Ill.

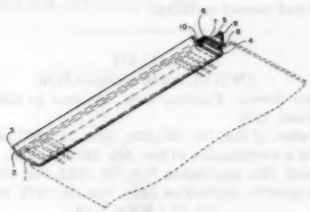
Filed Jun. 1, 1982, Ser. No. 383,906
Int. Cl.³ B23K *3/00*; H05K *3/34*
U.S. Cl. 228—57 **3 Claims**

1. A tab protector for use in wave soldering of printed wiring cards comprising:

a horizontally elongated "S" shaped strip having a first hooked portion of said "S" shape dimensioned to slip over the tabs to be protected; and

a second oppositely facing hooked portion of said "S"

shaped strip to deflect solder away from said tabs and including a filet of metal at each end of said "S" shaped



strip to close said second hooked portion of said "S" shape to prevent entry of solder thereinto.

4,457,467

METHOD FOR POSITIONING AND FIXING OPTICAL COMPONENTS RELATIVE TO ONE ANOTHER

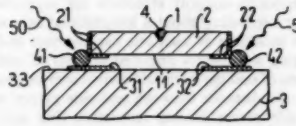
Ekkehard Klement, Munich, and Julius Wittmann, Deisenhofen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 22, 1982, Ser. No. 400,956

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138296

Int. Cl.³ B23K *31/02*

U.S. Cl. 228—103 **15 Claims**



1. A method for positioning and fixing optical components relative to one another, said method comprising the steps of providing a carrier plate having an optical component secured thereon and having at least one solderable area, providing a retaining plate having at least one solderable area, securing at least one optical component on said retaining plate, positioning the retaining plate above the carrier plate with a reference mark on each of said plates being aligned and the solderable area of the retaining plates being disposed in alignment with solderable areas on the carrier plate to form aligned pairs, while continuing to hold the plates in the aligned position applying at least one solder piece at each aligned pair of solderable areas, melting the solder pieces, allowing the molten solder to solidify to secure the aligned plates together and then releasing the holding of said plates.

4,457,468

RAILROAD GRADE CROSSING CONSTRUCTION

Harvey E. Hales, deceased, late of St. Augustine, Fla. by Margaret C. Hales, legal representative, and Edmund R. Fredrick, St. Augustine, Fla., assignors to Railroad Concrete Crosstie Corporation, St. Augustine, Fla.

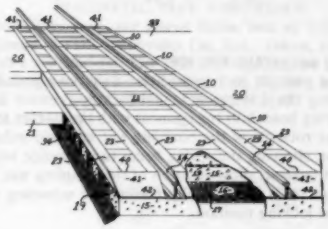
Continuation-in-part of Ser. No. 069,292, Aug. 24, 1979, Pat. No. 4,267,969. This application May 8, 1981, Ser. No. 261,776

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.³ E01C *9/04*

U.S. Cl. 238—8 **12 Claims**

1. In a railroad grade crossing where a highway crosses a pair of parallel railroad rails supported by and affixed to a plurality of substantially rigid and non-compressible parallel ties, the associated structure of generally rectangular shape having two sides interfacing with said highway and two ends generally coinciding with the shoulders of said highway, said structure comprising a plurality of interior panels between said pair of rails and a pair of pluralities of exterior panels joining the outside of each rail to said highway, each of said interior and exterior panels being generally in the shape of a right rectangular prism having an upper rectangular surface, a lower rectangular surface, and four rectangular sides, each panel constructed of four railroad rail sections forming the sides of said panel and being positioned with the base of the rail section in the upper surface of the panel, said four rail sections being joined with sufficient reinforcing metal cross pieces to produce a rigid structure with all the remaining space between the upper and lower surfaces of said panel interiorly of said four rail sections filled with structural concrete, and with all exterior irregularities, including the exterior portions around said four rail sections, filled with an elastomeric compound; each said interior panel having on its lower surface in the vicinity of each corner a guideway opening through said lower surface



and terminating spacedly downwardly from said upper surface and cooperating with respective and spaced studs firmly attached to and upwardly projecting from said parallel ties underlying said guideways, each said exterior panel having on its lower surface at least a pair of guideways opening through said lower surface and terminating spacedly downwardly from said upper surface, at least a pair of studs firmly attached to and upwardly projecting from respective and spaced said parallel ties underlying said pair of guideways; and each panel being substantially completely supported on a plurality of said parallel ties and separated therefrom by a layer of an elastomeric compound, said studs in said guideways of said interior and exterior panels permitting limited lateral and vertical relative movement between said ties and panels with said layer of elastomeric compound dampening the vibrational relative movement therebetween, the upper surfaces of said interior panels and said exterior panels at said ends of said associated structure sloping downwardly and outwardly from a location adjacent the shoulder of said highway to a juncture with said lower surface.

4,457,469

COUPLING NUT FOR AN ELECTRICAL CONNECTOR

Lloyd G. Ratchford, Oneonta, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 30, 1982, Ser. No. 431,972

Int. Cl.³ H01R *13/629*

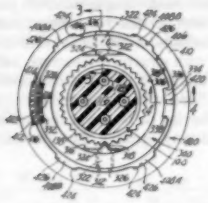
U.S. Cl. 339—89 M **14 Claims**

1. A coupling nut for an electrical connector assembly of the type having a pair of cylindrical mating shells (100, 200) with one shell (100) including a plurality of ratchet teeth (138) arranged annularly and extending radially outward and the other shell (200) having external thread (220) on an outside portion thereof; the coupling nut including a spring beam (316) having a medial tooth (318) adapted to engage the ratchet teeth (138) and a tubular coupling sleeve (310) captivated for rotation about said one shell and provided with an internal thread (320) for threadable coupling with the external thread (220)

disposed on the other of said shells, so that when said threads (220, 320) are engaged rotation of the coupling nut in one direction draws the shells (100, 200) together, said coupling nut characterized by:

said medial tooth (318) being normally biased by said spring beam (316) radially outwardly from engagement with said ratchet teeth (138);

drive means (322) cooperatively associated with said spring beam (316) for driving said medial tooth (318) thereof into engagement with the ratchet teeth;



actuating means (410, 406, 408) movable between a first and locking position to a second and unlocking position for actuating the drive means, said locking position driving the spring beam into engagement with the ratchet teeth to prevent rotation of the coupling nut and said unlocking position allowing the spring beam to disengage with the ratchet teeth to allow rotation of the coupling nut; and

bias means (422) for normally biasing the actuating means into the locking position.

4,457,470

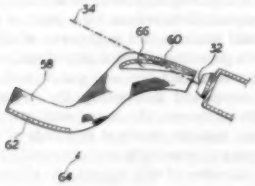
IMPULSE SPRINKLER

Harry L. Hauger, and Glenn I. Beal, both of Somerset, Pa., assignors to R. M. Smith, Inc., Somerset, Pa.

Filed Apr. 5, 1982, Ser. No. 365,400

Int. Cl.³ B05B *3/08*

U.S. Cl. 239—230 **4 Claims**



1. In an oscillating impulse sprinkler having a nozzle adapted to forcefully direct a stream of liquid along an axis in predetermined relation thereto and an impulse arm having first and second cooperating concave stream-diverting surfaces mounted in fixed relative spaced relation for integral movement to and from said stream with said concave surfaces disposed toward a predetermined stream path therebetween, the impact of said stream upon said first and second surfaces intermittently urging said sprinkler through a predetermined arcuate path, wherein said first surface is adjacent said nozzle and said second surface is spaced more distally from said nozzle in non-overlapping relation to said first surface to provide a lateral opening therebetween, wherein portions of said stream are diverted through said lateral opening as a result of nonuniform distribution of said stream along said first surface, the improvement comprising:

a plurality of spaced, upraised ribs on said first surface extending generally parallel to the direction of movement of said stream as it passes along said first surface, said ribs increasing the uniformity of distribution of said stream along said first surface and reducing the portion of said stream diverted through said lateral opening between said first and second surfaces.

4,457,471

SWIVEL ARM IRRIGATOR

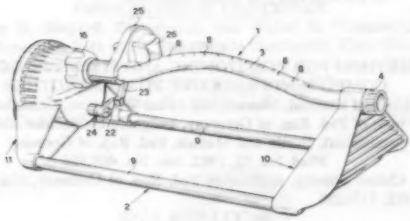
Gianfranco Roman, Pasiano, Italy, assignor to Claber S.p.A., Pordenone, Italy

Continuation of Ser. No. 361,604, Mar. 25, 1982, abandoned, which is a continuation of Ser. No. 159,284, Jun. 13, 1980, abandoned. This application Nov. 19, 1982, Ser. No. 443,029

Claims priority, application Italy, Jun. 26, 1979, 21950/79[U]

Int. Cl.³ B05B *3/14*

U.S. Cl. 239—242 **6 Claims**



1. A swivel arm irrigator comprising a tubular swivel arm with radial bores, a support structure for supporting said swivel arm for oscillating about a longitudinal axis, said support structure including at least one bar and first and second ground-engaging side pieces disposed at ends of said swivel arm and at ends of said bar with said swivel arm and bar generally spanning the distance between said side pieces, said first and second side pieces having respective first and second releasable securing means for removingly and rotatably supporting respective first and second ends of said swivel arm relative to said respective first and second side pieces, said first and second side pieces having respective first and second means for defining first and second recesses opening toward each other for receiving respective first and second ends of said bar, said first side piece including control means for oscillating said swivel arm about said longitudinal axis, means for feeding water into said swivel arm, said first and second releasable securing means being effective when secured to said first and second swivel arms ends for holding said first and second side pieces at a predetermined distance from each other thereby holding said bar ends captive in said recesses, and at least one of said first and second releasable securing means being effective when released from its associated first and second swivel arm end to release said first and second side pieces for relative movement beyond said predetermined distance thereby allowing the withdrawal of said bar ends from said recesses.

4,457,472

EXTENDABLE SPRAY GUN

John D. Geberth, Jr., 10 Goose Cove La., Ramsey, N.J. 07446

Filed Nov. 8, 1982, Ser. No. 439,903

Int. Cl.³ B05B *15/08*

U.S. Cl. 239—532 **16 Claims**

1. An extendable spray gun for hydraulically atomizing and spraying liquids, which includes:

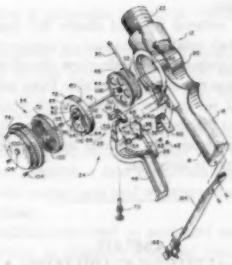
(a) a telescopically extendable pole having first and second ends;

(b) means for adjustably securing the length of said pole;

(c) a handle portion included at the first end of said pole;

(d) a spray head having a control valve included at the second end of said pole;

(e) conduit means connected to said spray head communicating with a source of liquid under pressure;
(f) trigger means included in said handle portion for directly actuating said control valve; and



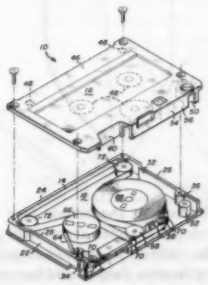
(g) means included in said trigger means for compensating for changes in the length of said telescoping pole whereby direct actuation of said control valve by said trigger means is unaffected by changes in the length of said telescoping pole.

4,457,473

TAPE CARTRIDGE HOUSING

Edward Mroz, Menlo Park, and Richard J. Wesendunk, Campbell, both of Calif., assignors to Data Electronics, Inc., San Diego, Calif.

Filed Jun. 4, 1982, Ser. No. 385,120
Int. Cl.³ G03B *1/04;* G11B *15/32*
U.S. Cl. 242—192 **7 Claims**



1. A belt driven magnetic tape cartridge housing, comprising:

a rigid one-piece base member including a bottom wall having a flat cross-section and a plurality of holes extending through the flat bottom of the base member, the base member including three side walls, two of which side walls are opposed, said side walls extending upwardly generally perpendicular to the bottom wall;

a resilient covering means for covering the base, the covering means including a top wall and a front wall, said front wall extending downwardly generally perpendicular to the top wall, said front wall having a generally open face;

means for connecting the covering means and the base member, whereby, when assembled, the base member remains flat in cross-section and undistorted by the resilient covering means; and

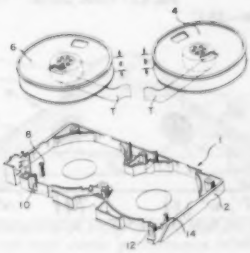
a plurality of pins secured in the holes through the flat bottom of the rigid base member for aligning and maintaining the installed pins perpendicular to the base member bottom for precision transport of a tape wound on rotating spools mounted on the pins.

4,457,474

MAGNETIC TAPE CARTRIDGE

Masatoshi Okamura, and Haruo Shiba, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed May 27, 1982, Ser. No. 382,764
Claims priority, application Japan, Jun. 18, 1981, 56-88740[U]
Int. Cl.³ G03B *1/05;* G11B *15/32*
U.S. Cl. 242—199 **3 Claims**



1. A combination of feeding and take-up reels in a magnetic tape cartridge, which comprises:

(a) a feeding reel constructed with an upper flange, a lower flange, a reel drum for connecting said upper and lower flanges, and a center boss projecting from the top surface of said upper flange; and

(b) a take-up reel constructed with an upper flange, a lower flange, a reel drum having a larger breadth than that of the reel drum in said feeding reel and for connecting said upper and lower flanges, a center boss projecting from the top surface of said upper flange, and means for differentiating said feeding reel and said take-up reel, said means for differentiating comprising color coding at least one of said center bosses.

4,457,475

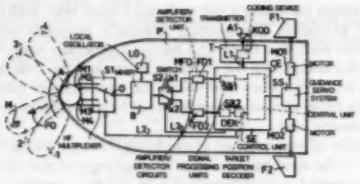
METHOD FOR DESTROYING TARGETS AND A PROJECTILE FOR CARRYING OUT THE METHOD

Lars G. W. Ahlström, Stockholm, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 298,130
Claims priority, application Sweden, Sep. 15, 1980, 8006458
Int. Cl.³ F41G *7/22*
U.S. Cl. 244—3.15 **6 Claims**

1. A method for guiding explosive projectiles fired towards a target, each projectile including a target tracking device which operates by receiving and detecting electromagnetic radiation and generating an error signal indicating a deviation

between the respective projectile's trajectory and a trajectory passing through the target, said error signal controlling guiding means on the projectile to reduce the deviation, characterized in that a burst of projectiles is fired, including at least one projectile which is provided with transmitting means con-



trolled by means for detecting a target, said transmitting means responding to detection of a target by transmitting a signal indicating the position of the target relative to the respective projectile, to another projectile in the burst, for effecting trajectory correction in said other projectile.

4,457,476

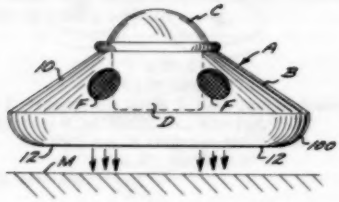
WINGLESS AIRCRAFT

Frank Andresevitz, c/o 5th Assembly of God, 16215, Oreszaba St., Paramount, Calif. 90723

Filed Nov. 20, 1981, Ser. No. 323,269

Int. Cl.³ B64C *29/00*

U.S. Cl. 244—23 C **5 Claims**



1. A wingless aircraft that includes:

a. a truncated cone shaped fuselage assembly that includes a bottom that has a plurality of circumferentially spaced openings therein, a side wall that tapers upwardly and inwardly from said bottom; a convex transparent dome removably secured to the upper portion of said side wall; a cockpit for a pilot situated in said fuselage below said dome; a plurality of circumferentially spaced fuel tanks disposed within said fuselage, a plurality of air intake openings in said side wall, and a plurality of tubular shrouds disposed within said fuselage each of said shrouds communicating with one of said air intake openings and one of said openings in said bottom, each of said shrouds defining a compartment isolated from the balance thereof;

b. a plurality of elongate jet engine assemblies, each of said jet engine assemblies including an air intake, a combustion chamber and a nozzle for hot gases of combustion that extend from said combustion chamber in a direction opposite from that of said air intake, each of said nozzles being an elongate tubular member having a lower end, and a plurality of elongate upwardly extending openings in each of said nozzles through which pressurized gases of combustion from the burning of said air and fuel discharge tangentially;

c. first means for pivotally supporting each of said jet engine assemblies in one of said compartments, with said nozzle and said jet engine extending downwardly;

d. second means for supplying atomized fuel from said fuel tanks to said combustion chambers;

e. third means for compressing air from said air intake openings prior to it discharging into said air intakes of said jet engines;

f. fourth means for initiating burning of said atomized fuel and compressed air in said combustion chambers to develop a plurality of thrusts through said nozzles that will lift said aircraft from the ground;

g. fifth means for rotatably supporting said nozzles from said combustion chambers;

h. a plurality of cylindrical shells disposed within said shrouds that extend around said nozzles and are secured to said engine assemblies;

i. a plurality of deflectors disposed in said cylindrical shells above said openings, said deflectors serving to direct hot gases of combustion discharging from said openings in said nozzles downwardly to exert an upward thrust on said aircraft to dispose the latter in an airborne position, said gases of combustion as they discharge tangentially through said openings in said nozzles causing the latter to rotate;

j. a plurality of plugs that close the lower ends of said nozzles and are rigidly secured thereto;

k. a plurality of shafts that extend upwardly from said plugs through said combustion chambers to positions adjacent said air intakes;

l. sixth means rotated by said shafts for compressing air entering said air intakes from said air intake openings prior to said air entering said combustion chambers; and

m. seventh means manually actuatable from said cockpit for pivoting said jet engine assemblies after said aircraft is airborne to so dispose the direction of thrust of said gases of combustion from said nozzles as to guide said aircraft when the latter is airborne.

4,457,477

PROCESS FOR ALTITUDE-STABILIZING A BALLOON, AND ATMOSPHERIC BALLOONS FOR IMPLEMENTING THIS PROCESS

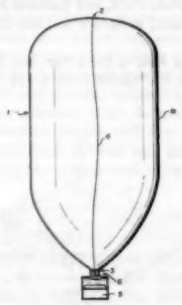
Robert Regipa, Toulouse, France, assignor to Centre National d'Etudes Spatiales, Paris, France

Filed Jun. 11, 1982, Ser. No. 387,471

Claims priority, application France, Jul. 8, 1981, 81 13813

Int. Cl.³ B64B *1/44, 1/70*

U.S. Cl. 244—97 **24 Claims**

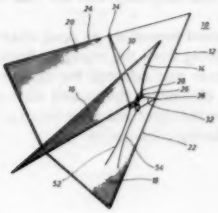


24. A aerostatic balloon of the hot-air type comprising a flexible-material envelope (29) open at its lower pole, a burner (30) suspended in the vicinity of the lower pole and supply means for feeding combustion fluid to said burner from a tank, an inter-pole link member (31) extending from its upper to its lower pole and coupled to said supply means of said burner so as to adjust the combustion-fluid flow-rate as a direct function of the tension in said link member.

4,457,478
KEEL GUIDED ACROBATIC KITE AND CONTROL APPARATUS THEREFOR

Julius M. Christoffel, Jr., and George Reneer, both of Houston, Tex., assignors to Gayla Industries, Inc., Houston, Tex.

Filed Aug. 12, 1982, Ser. No. 407,338
Int. Cl.³ B64C 31/06
U.S. Cl. 244—155 A 14 Claims

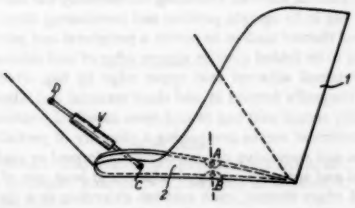


1. A keel guided kite comprising:
a body;
a keel having a generally triangular configuration and including:
an edge secured to said body and extending generally fore and aft of said body, dividing said body into first and second wing portions, each of said wing portions having a reference location; and
an angular corner disposed opposite said edge;
a first stabilizer secured to said keel and to said first wing portion to establish a first maximum separation between said angular corner and said reference location of said first wing portion;
a second stabilizer secured to said keel and to said second wing portion to establish a second maximum separation between said angular corner and said reference location of said second wing portion; and
control means for reducing the separation between said angular corner and the reference location of at least one of said first and second wing portions to less than said first and second maximum separations.

4,457,479
WINGLETS FOR AIRCRAFT WING TIPS

Martine Daude, Résidence les Tuileries 4, Square Castiglione, 78150 Le Chesnay, France

Filed May 20, 1982, Ser. No. 380,473
Claims priority, application France, Feb. 15, 1982, 82 02548
Int. Cl.³ B64C 13/16
U.S. Cl. 244—203 7 Claims

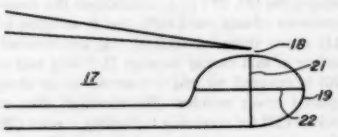


1. In an aircraft including a pair of structurally conventional elongate wings, each having a leading edge, a trailing edge and a wing tip, the improvement comprising a retrofit assembly for said structurally conventional wings, said retrofit assembly including
a winglet situated at each of said wing tips so as to extend substantially upwardly therefrom, at least a portion of the winglets being movably mounted; and
means for automatically moving said winglets or said portions thereof symmetrically with respect to the aircraft plane of symmetry between a first position wherein each winglet has a first aerodynamically optimal working angle of attack and a second position wherein the winglet has a second minimal angle of attack wherein said winglets add substantially no bending moment to the wings, said automatic means including means provided on said wings for sensing the stress on said wings such that when said sensed stress reaches a certain predetermined value, said moving means are actuated to move said winglets or movable portions thereof from said first position to said second position.

4,457,480
MONO-ELEMENT COMBINED SUPERCRITICAL HIGH LIFT AIRFOIL

Robert J. Englar, Derwood, and Gregory G. Huson, Gaithersburg, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 238,265, Feb. 25, 1981, Pat. No. 4,387,869. This application Nov. 26, 1982, Ser. No. 444,555
The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.
Int. Cl.³ B64C 21/04
U.S. Cl. 244—207 6 Claims



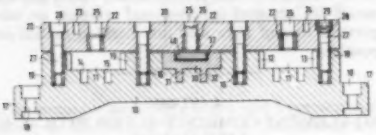
1. A mono-element airfoil for providing high lift generation, drag reduction and high cruise performance at subsonic and transonic speeds, comprising:
a supercritical airfoil means having a large leading edge radius and a relatively blunt trailing edge, said trailing edge having a thickness of about 2% of the chord length of said airfoil means;
a plenum inside said wing having an inlet connected to a source of gas pressure and an outlet in the trailing edge of said airfoil means;
said outlet being formed as a slot means between an upper portion and a lower portion;
said upper portion being a part of the upper surface of said wing and having a reduced thickness near the rear edge;
said lower portion forming the rear wall of said plenum, the lower edge of said slot and the trailing edge of said airfoil means, said lower portion being elliptical in cross-section and having a minor axis no greater than 2% of the chord length of said airfoil means;
said slot means having a smoothly converging nozzle with the portion of said nozzle having the minimum height being at the rear edge of said upper portion;
said outlet forming a circulation control device wherein gas from said source of gas pressure is controlled to travel through said plenum, escape through said converging nozzle and slot means and travel along the trailing edge of said airfoil to deflect the air traveling over the top surface of said airfoil means downwardly, so that high lift on the airfoil is caused by this deflected large flow of air which remains strongly attached to said trailing edge with a relatively low jet blowing rate through said slot means while low cruise drag is encountered when blowing is stopped.

4,457,481

HOLDER FOR LIGHT TRACKS

Hans Wagener, Dietzholztal, Fed. Rep. of Germany, assignor to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany

Filed Aug. 26, 1982, Ser. No. 411,706
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1981, 3143518
Int. Cl.³ F21L 21/08
U.S. Cl. 248—68.1 14 Claims



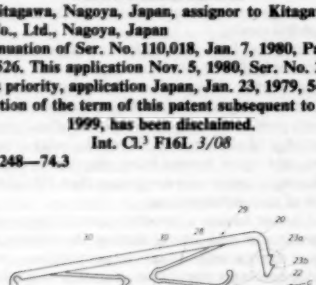
1. Holder for light tracks, of an elongate generally squared carrier member having a plurality of channel-shaped recessed areas in its upper surface for receiving light tracks therein, and means for securing said light tracks in said channels, characterized in the width of said recessed channels (11) in said carrier member (10) is greater than, and the depth of said channels (11) is greater than or equal to, the maximum cross-sectional dimensions of said light tracks (40), that said channels (11) in said carrier member (10) are adapted to receive and fixedly retain plug-in members (30, 30.1, 30.2) matching the dimensions of said channels (11) and their upper surfaces being provided with receptacles (37, 37') to accommodate the cross-sectional configuration of said track (40), that in addition to said channels (11) screw threaded sockets (16) are inserted in the upper surface of said carrier member (10), that said carrier member (10) is covered by and connected to an elongate generally squared cover member (20) provided with screw threaded sockets (22) for receiving tightening screws (26) and which is adapted to accept tightening screws (27) engaging threaded sockets (16) in said carrier member (10) and having holes (21) with specially dimensioned sections for accepting heads (28) of said screws (27) and covering said channels (11) in said carrier member (10) and hence said receptacles (37, 37') of said plug-in members (30, 30.1, 30.2).

4,457,482

FLAT CABLE CLAMP

Hiroji Kitagawa, Nagoya, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 110,018, Jan. 7, 1980, Pat. No. 4,325,526. This application Nov. 5, 1980, Ser. No. 204,354
Claims priority, application Japan, Jan. 23, 1979, 54-7348[U]
The portion of the term of this patent subsequent to Apr. 20, 1999, has been disclaimed.
Int. Cl.³ F16L 3/08
U.S. Cl. 248—74.3 6 Claims



1. A flat cable clamp, comprising:
a base board having two ends;
a rockingly movable press board for clamping a flat cable to said base board, said press board formed integrally with said base board at one end thereof and having an engaging hook at the other end thereof;
means for locking said base board to said press board, including
said engaging hook,
an unlock lever, and
an opposing engaging hook disposed at the engaging tip of said unlock lever, the unlock lever and its engaging hook being formed integrally with the base board at said other end;
said press board presenting an open channel at its tip; and
a tab protruding from the engaging hook at the tip of said unlock lever and adapted for cooperative engagement with said channel in the locked state and for exerting a pressure on the tip of said press board at the bottom of said channel during unclamping.

4,457,483

COLLAPSIBLE SUPPORT FOR GARBAGE BAGS

Lauréat Gagné, 3 Morley St., Greenfield Park, Quebec, Canada J4V 2Y8

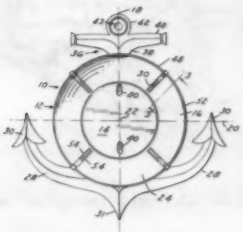
Filed Oct. 8, 1981, Ser. No. 309,584
Int. Cl.³ B65B 67/12
U.S. Cl. 248—97 12 Claims

1. A collapsible support for bags, said support being formed from a one-piece blank made of flexible sheet material and having fastening means holding said sheet material to define an open-ended form-retaining structure of substantially constant cross-section for receiving a bag positionable interiorily or exteriorily thereof and supporting same in an upright open-mouthed position, said form-retaining structure having a solid circumferential sidewall extending substantially the full height of said bag in its upright position and terminating short of the open end thereof such as to permit a peripheral end portion of said bag to be folded over an uppper edge of said sidewall and to be retained adjacent said upper edge by bag attachment means integrally formed in said sheet material and adapted to releasably secure said bag in said open-mouthed position, said bag attachment means comprising a plurality of partially cut-out tabs and respective cut-out openings formed in said sheet material and spacedly arranged adjacent at least one of opposite end edges thereof, each said tab extending in a direction toward said at least one end edge and being resiliently urged to normally close its respective opening to thereby entrap therebetween said peripheral end portion of said bag folded over said one end edge constituting said upper edge and received through said respective opening, each said tab further having a smooth curved edge for engaging the folded peripheral end portion of said bag without damaging same.

4,457,484
DISPLAY MOUNTING ASSEMBLY FOR COLLECTOR PLATES

Helen M. Hameister, 40638 Colony Dr., Sterling Hts., Mich. 48078

Filed Dec. 28, 1981, Ser. No. 334,711
Int. Cl.³ A47G 1/16
U.S. Cl. 248—490 5 Claims



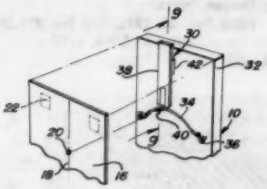
1. A mounting assembly for supporting a plate in an attitude suitable for display, and assembly comprising a frame having a first generally flat and circular inner plate portion with a center axis and a second integral curved outer rim portion around the outer periphery of said plate portion, said portions being generally bowl shaped for receiving a plate on the inner surface thereof, a plurality of elongated slots provided in and extending through said rim portion, each slot extending from the outer edge of said rim portion towards said plate portion, a plurality of radially spaced apart protuberances located on the outer surface of said rim portion along opposed longitudinal edges of each slot, an adjustable clip slidable in each slot, each clip including a cradle adapted to receive and to engage a peripheral edge portion of a plate when placed on said inner surface, each clip having a generally flexible arm engageable with the outer surface of said rim portion and with one of the protuberances to be retained thereby in an adjusted position, each clip includes an elongated base having opposed channels in the longitudinal edges thereof, each slot including a pair of longitudinally spaced guide elements which are received in the opposed channels of the corresponding clip whereby the clip is guided in the slot by said guide elements, and with one side of said clip base being longer than the other side and curved at one end to form said cradle, said flexible arm being connected to the other side of said base at one end thereof, and the longitudinal axis of said flexible arm being perpendicular to the longitudinal axis of said base, and wherein there are an equal number of protuberances along each slot, with each protuberance of each slot having corresponding protuberances in the remaining slots which are spaced the same distance from the outer edge of said rim portion.

4,457,485
WALL HANGING METHOD AND MEANS

Madlon C. Landt, Raleigh, N.C., assignor to William E. Lynn, Raleigh, N.C.

Filed Dec. 7, 1981, Ser. No. 328,005
Int. Cl.³ F16M 13/00
U.S. Cl. 248—542 19 Claims

13. For use in hanging an ornamental article on a supporting surface, the article having a hanger device secured thereto, means for locating a hanging point on the supporting surface, including an elongated member having opposite ends, marking means secured to one of said ends for engagement with the hanger device, and removable transfer means responsive to

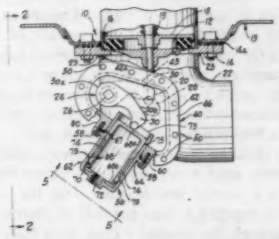


contact with the article for transferring markings made thereon by the marking means to the supporting surface.

4,457,486
DISCHARGE CONTROL MEANS FOR A STORAGE TANK FOR LIQUID

Joseph H. DeFrees, deceased, late of Warren, Pa., assignor to Allegheny Valve Company, Warren, Pa.

Filed Apr. 29, 1982, Ser. No. 373,099
Int. Cl.³ F16K 31/16
U.S. Cl. 251—58 14 Claims



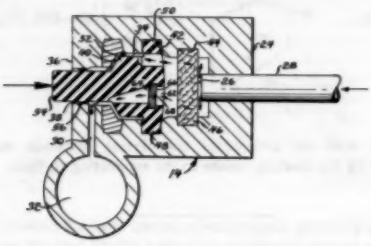
1. A discharge control means for a liquid storage tank having an outlet port, said control means comprising an emergency valve including a projecting valve portion, operatively associated with said port and with said valve being normally biased to closed position whereby discharge from said tank is normally prevented, valve operating means associsted with said emergency valve and responsive to air pressure for overcoming the normal valve closing bias, said valve operating means comprising a crank, which includes an operating head for coaction with said valve portion of the emergency valve and an operating lever, a crank case in which said lever is disposed and which is adapted for receiving therein a lubricant, and an air operated reciprocal motor unit secured to the crank case and including a cylinder and a piston movable lengthwise therein, said piston being adapted for coaction with said lever upon application of pressurized air to said motor unit, to cause said operating head of said crank to move the emergency valve via said valve portion to open position, and wherein said reciprocal motor cylinder has exterior means thereon projecting laterally for detachably connecting said cylinder to said crank case, one end of said cylinder being closed and the other end of said cylinder being open and located within said crank case, and said piston being disposed within said cylinder and adapted for reciprocal movement therein, said piston being adapted for engagement with said operating lever for actuation of said crank upon application of compressed air to said cylinder for actuation of said piston.

4,457,487

FLUSHING DEVICE

Carl J. Steigerwald, Wauconda, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jun. 23, 1982, Ser. No. 391,193
Int. Cl.³ F16K *1/32*
U.S. Cl. 251—117 **3 Claims**



1. A flushing device, comprising:

a housing having an inlet, an outlet, a cavity communicating between the inlet and outlet and defining an annular valve seat, an opening communicating with the cavity, with the valve seat facing away from the opening;

an elastic valve element consisting of resilient material received in the cavity with an annular valve portion sealingly engaged against the seat, said valve element having a stem of one-piece construction with the valve portion extending through the opening and means on the stem for sealingly engaging against the portion of the housing defining the opening, said valve element having passageway means extending therethrough and communicating between the inlet and outlet, said device having relatively large channel means communicating between the inlet and seat and between the seat and outlet; and

an insert extending across the passageway means and having a relatively small bore, said valve element being movable between a normal first position with the valve portion sealingly engaged against the seat to obstruct passage of fluid through the channel means, with fluid passing at a slow rate through the insert bore, and with the stem means sealingly engaging against the housing to prevent passage of fluid through the opening, and a second flushing position by pressing the stem toward the housing, with the valve portion spaced from the seat to permit a fast flow of fluid through the channel means and past the seat, and with the stem means sealingly engaging against the housing to prevent passage of fluid through the opening.

4,457,488

SLUICE VALVE ARRANGEMENT

Hiroshi Ishii, Tokyo; Hiroshi Morii, and Saburo Ishijima, both of Yokohama, all of Japan, assignors to Japan Oxygen Co., Ltd., Japan

Filed Jun. 9, 1982, Ser. No. 386,779
Int. Cl.³ F16K *31/02*
U.S. Cl. 251—133 **5 Claims**

1. A sluice valve arrangement adapted to open or shut an opening portion through which a workpiece is led into or out of a vacuum chamber comprising:

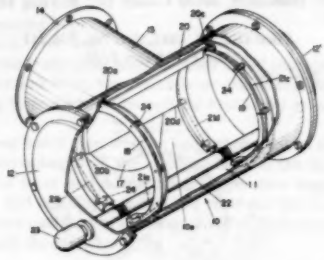
(A) a housing having a curved inner surface defining a valve seat portion and having an inlet and an outlet;

(B) a pair of spaced-apart guide rails attached to the inner circumference of said housing on either side of said outlet;

(C) a curved valve member slidingly supported on said guide rails for rotary movement;

(D) the curvature of said valve member being substantially equal to that of said curved surface;

(E) air-tight engagement means comprising a plurality of bellows expandable by compressed gas to push said valve



member to the valve seat portion of said curved surface; and

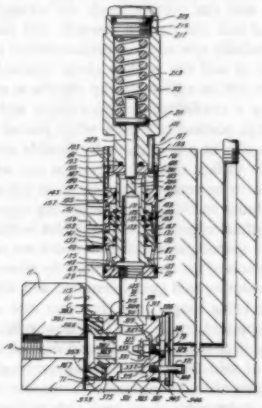
(F) actuating means for said valve member.

4,457,489

SUBSEA FLUID CONDUIT CONNECTIONS FOR REMOTE CONTROLLED VALVES

Samuel E. Gilmore, 5119 Pine St., Bellaire, Tex. 77401

Filed Jul. 13, 1981, Ser. No. 282,429
Int. Cl.³ F16L *37/28*
U.S. Cl. 251—148 **33 Claims**



1. Conduit connection comprising:

a first body having a first passage therein providing a conduit,

a second body having a second passage therein providing a conduit,

said second body having an opening therein adjacent one end of the second passage,

connection means slidably disposed in said opening for movement between a retracted position in which it is out of engagement with said first body and an extended position in which it engages the first body outside of said first passage in an area extending around said first passage without interlocking said bodies against relative movement transverse to the direction of extension of said connection means,

said connection means having a third passage therethrough adapted to communicate with said first and second passages when said connection means is extended, and

actuation means for moving said connection means between extended and retracted positions,

said second passage having a near end adjacent said area where said connection means when extended engages said second body,

said third passage having a proximal end which when said connection means is extended contacts said area, and

when said connection means is extended all points on said near end of said second passage and said area therearound being on the side away from said first body of a plane perpendicular to the direction of movement of said connection means which plane passes through the points on said proximal end of the connection means which are farthest from said first body.

4,457,490

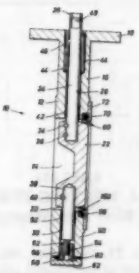
HIGH TEMPERATURE VALVE AND SEAT THEREFOR

William B. Scobie, Houston, Tex., assignor to Keystone International, Inc., Houston, Tex.

Filed Feb. 1, 1982, Ser. No. 344,501

Int. Cl.³ F16K *25/00*

U.S. Cl. 251—174 **19 Claims**



1. A valve seat for use in a fluid control valve having a pivotable valve closure element to open and close said valve comprising:

an annular, polymeric member having a seating surface for sealingly engaging said valve element when said valve is in the closed position; and

a multiplicity of circumferential windings of material in surrounding relationship to said annular member, each of said windings comprising an elongate strand of said material, each of said strands having its centerline oriented substantially circumferentially with respect to said sealing section for generally the full length of said windings, the ends of said windings being fixed with respect to one another, said windings being placed in tensile stress due to circumferential stretching when said valve is in the closed position.

4,457,491

EXTREME-TEMPERATURE SEALING DEVICE AND ANNULAR SEAL THEREFOR

Richard L. Dudman, Euclid, Ohio, assignor to EGC Enterprises Incorp., Mentor, Ohio

Filed Dec. 9, 1982, Ser. No. 448,199

Int. Cl.³ F16K *5/06*

U.S. Cl. 251—317 **33 Claims**

1. An extreme-temperature annular sealing element adapted to form a seal between a rotatable opposed member having a partial spherical sealing surface and a body member comprising:

a flexible expanded graphite body having an outer surface, said flexible expanded graphite body being an annular member,

said outer surface of said flexible expanded graphite body having an outer end surface, and an annular contact surface adapted for sealing contact with said rotatable opposed member,

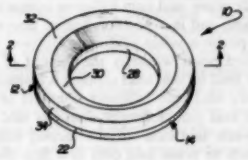
said outer end surface of said flexible expanded graphite body comprising a body member contact surface adapted for sealing contact with said body member,

said annular contact surface being a curved surface with a radius substantially to conform to said rotatable opposed member,

said flexible expanded graphite body being sufficiently resilient to conform and yield under pressure between said rotatable opposed member and said body member, and

a metallic protective sheath affixed to a portion of said outer surface of said flexible expanded graphite body,

said metallic protective sheath being affixed to said annular contact surface of said flexible expanded graphite body,



said metallic protective sheath having a thickness adapted to withstand sliding contact with said rotatable opposed member and adapted to permit said flexible expanded graphite body to resiliently yield to seal said sheath against said rotatable opposed member,

said body member contact surface of said outer end of said flexible expanded graphite body being at least partially exposed and adapted for sealing contact with said body member to resiliently yield under pressure between said body member and said rotatable opposed member,

said flexible expanded graphite body and said metallic protective sheath being able to withstand temperatures greater than about 500° F. and less than about −100° F.

4,457,492

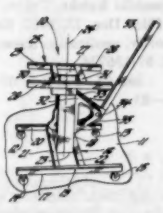
LIFTING APPARATUS

Terry L. Lahti, Rte. 1, Box 98, Houghton, Mich. 49931

Filed Sep. 20, 1982, Ser. No. 420,582

Int. Cl.³ B66F *3/00*

U.S. Cl. 254—8 B **6 Claims**



1. Apparatus for lifting a load above a surface comprising, in combination, a telescopic column, said column being substantially defined by a vertical longitudinal axis and including upper and lower sections in slidable relation, said lower section including a base for supporting said column on said surface, said upper section including a load support for supporting said load; a cam follower secured to one of said column sections; a cam pivotally secured at a pivot having a substantially horizontal axis to the other of said column sections, said cam having a cam surface in contact with said cam follower so that when said cam is pivoted said cam follower follows said cam surface and said column is telescoped, said cam surface having points which contact said cam follower including first, second and third points, said column having a first length when said cam

follower contacts said cam surface first point, said column having a second length longer than said first length when said cam follower contacts said cam surface second point, said column having a third length longer than said second length when said cam follower contacts said cam surface third point, said cam surface third point being between said cam surface first and second points, said cam surface being inclined relative to said pivot between said cam surface second and third points so as to prevent said cam follower moving from said cam surface second point to said cam surface third point without lengthening said column; and actuator means for pivoting said cam about said pivot so as to move said cam surface relative to said cam follower from said cam surface first point to said cam surface second point and back to said cam surface first point whereby said load may be supported by said upper section in a low position above said surface when said cam follower contacts said cam surface first point, in a high position above said surface when said cam follower contacts said cam surface second point, and in a position higher above said surface than said high position when said cam follower contacts said cam surface third point whereby the weight of said load support and of any load on said load support is transmitted through said point where said cam follower contacts said cam surface so that when said cam follower contacts said cam surface at a point between said cam surface second and third points said weight tends to pivot said cam in a first direction about said pivot so as to move said contact point toward said second point and when said cam follower contacts said cam surface at a point between said cam surface first and third points said weight tends to pivot said cam in a second direction opposite said first direction, said actuator means including a handle and first and second links that each have first and second ends, said first link first end being pivotally attached to said other section at said pivot and being rigidly attached to said cam, said second link first end being pivotally attached to said other section at another pivot, said seconds ends of said first and second links each being pivotally attached to said handle whereby lowering said handle toward said surface pivots said cam in said first direction so as to move said cam surface past said cam follower from said cam surface first point toward said cam surface second point and raising said handle above said surface pivots said cam in said second direction so as to move said cam surface past said cam follower from said cam surface second point toward said cam surface first point.

4,457,493

GAS ATMOSPHERE HEATING FURNACE

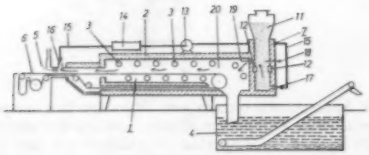
Susumu Takahashi, Yokohama, Japan, assignor to Kanto Yakin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1982, Ser. No. 452,835

Claims priority, application Japan, Jun. 24, 1982, 57-108875; Aug. 5, 1982, 57-136774

Int. Cl.³ F27B *9/40*; C21D *9/00*

U.S. Cl. 266—81 **3 Claims**



1. A gas atmosphere heating furnace, which comprises

means defining an elongated furnace passage provided at its forward end with a reception opening for metal articles to be treated in the furnace passage as they pass therethrough, and at its rearward end with a discharge opening for discharging the treated articles,

first heating means in said furnace passage for heating said passage and the articles passing therethrough,

conduit means extending outside of the furnace and communicating adjacent opposite ends thereof with the reception and the discharge openings respectively, of the furnace passage and forming a substantially closed circuit with said furnace passage for circulating a gas atmosphere through said passage,

said conduit means including a reaction chamber positioned adjacent to and in communication with said furnace passage, and containing carbon,

second heating means in said reaction chamber, and

means for controlling the operation of said second heating means independently of said first heating means for maintaining the ratios of CO/CO_2 and H_2/H_2O in the gas atmosphere such that said atmosphere is reductive.

4,457,494

METAL MELTING FURNACE

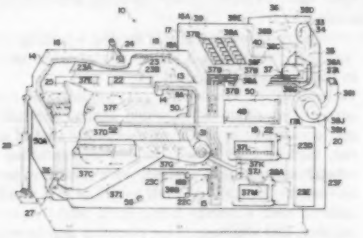
Roy Fisher, 409 - 595 River Ave., Winnipeg, Manitoba, Canada R3L 0E6

Filed Jan. 21, 1983, Ser. No. 460,070

Claims priority, application United Kingdom, Jan. 21, 1982, 8201700

Int. Cl.³ F27B *14/02*

U.S. Cl. 266—140 **25 Claims**



1. A melting furnace together with a source of burner fuel and comprising in combination a main body, means mounting said body for fore and aft tilting action, vertically situated dividing walls in said body defining the interior thereof into a melt chamber and a combustible gas producing pyrolysis chamber a separate liquid metal holding chamber within said melt chamber, an exhaust gas cleaning chamber, means communicating between said melt chamber and said holding chamber adjacent the front upper side of said holding chamber, a burner assembly for said melt chamber and a further burner assembly for said holding chamber, means operatively connecting said combustible gas producing chamber with said first mentioned burner assembly on a selective basis, exhaust means for said furnace communicating between said melt chamber, said holding chamber and said exhaust gas cleaning chamber, a separate charging door for said melt chamber, and said holding chamber and a metal tapping hole in said holding chamber and selectively communicating through the wall of said main body.

4,457,495

APPARATUS FOR THE AUTOMATIC RECOVERY OF SILVER FROM ARGENTIFEROUS WASH WATERS

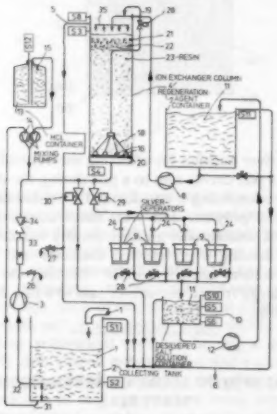
Wilhelm Eder, Leverkusen; Hans Hofmann; Joachim Kloeppel, both of Cologne; Heinz Mecki, and Josef Busch, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 299,870

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034102

Int. Cl.³ C22B *11/04*

U.S. Cl. 266—170 4 Claims



1. In apparatus for the automatic recovery of silver from wash water containing silver, comprising

an ion exchange column filled with resin for absorbing contained silver and provided with means for guiding a regeneration liquid around the resin to desilver the resin in counterflow without loss of resin,

a silver separator,

a multiple time switch clock,

a collecting tank adapted to receive wash water containing silver

a first pump adapted to transport the wash water and silver from the tank to the column and to the resin,

a first means for controlling the flow of the wash water and silver from the tank to the column,

whereby the silver is deposited in the column

a discharge outlet

an overflow means adapted to transport the wash water from the column to the discharge outlet;

an agent container,

means in said separator for separating the silver from the water,

a second pump being adapted to move a regeneration agent from the agent container to said column,

a second means for guiding the flow of the regeneration agent from the container to the column and to the resin,

and for controlling the flow of the regeneration agent from the column to the silver separator

a reservoir for collecting the desilivered agent

a third pump being adapted to move the agent from the reservoir to the agent container

an acid container

at least two mixing pumps adapted to mix an acid with wash water from said collecting tank,

a third means for guiding the flow of the mixture of acid and wash water to the column,

means controlled by said clock for selectively switching said first, second and third means adapted to selectively guide and control the flow.

4,457,496

FILTRATION BLOCK FOR LIQUID METALS AND ALLOYS, WITH A MECHANICAL AND PHYSICAL-CHEMICAL EFFECT

Pierre du Manoir de Juaye, Vimines Cognin; Pierre Guerit, Chambery; Gilbert Pollet, LaRavoire, and Marc Vassiliadis, Saint Germain en Laye, all of France, assignors to Servimetal, France

Continuation of Ser. No. 111,905, Jan. 14, 1980, abandoned. This application Apr. 9, 1982, Ser. No. 366,848

Int. Cl.³ C22B *21/06*

U.S. Cl. 266—227 7 Claims

1. A solid, porous filtration block for purification of liquid alloys and metals by the combination of simultaneous mechanical and physical-chemical effect, consisting essentially of a plurality of solid elements agglomerated by sintering into a structurally strong, composite solid block with open pores between the elements forming the agglomerated filtering block, in which at least the outside surface portions of the agglomerated elements are formed by an active mineral fluoride, the melting points of the elements and the active mineral fluoride being higher than the melting temperature of the metal to be treated.

4,457,497

SPRING BALANCER FOR PIVOTABLE COVER LID

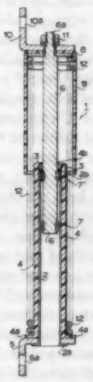
Juji Ojima, Ebina, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed May 7, 1981, Ser. No. 261,665

Claims priority, application Japan, May 8, 1980, 55-63046[U]

Int. Cl.³ F16F *9/00*

U.S. Cl. 267—9 R 4 Claims



1. A spring balancer for a pivotable cover lid, said balancer comprising: a rod having one end portion thereof movably carried in an axial direction in a metallic cylinder that is exteriorly coated with a synthetic resin layer, one end of the rod attached to a bracket spaced from one end portion of said metallic cylinder, a guide cylinder made of synthetic resin having a larger inner diameter than the outer diameter of said metallic cylinder and having an end therof closed and secured to said one end of said rod at said bracket, the open end of said guide cylinder overlying said metallic cylinder, and a compression coil spring positioned within said guide cylinder and overlying said metallic cylinder and said rod, one end of said spring contacting the closed end of said guide cylinder and the other end contacting the bracket of the metallic cylinder, said balancer installed between a fixed body and a movable lid

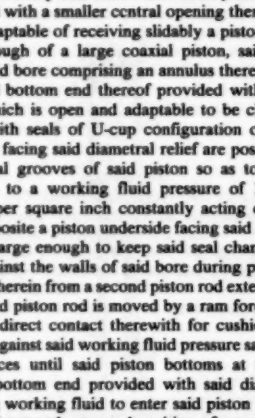
attached pivotally to said fixed body through a horizontal revolution axis so that the magnitude of the moment of revolution of said lid may be offset by the reaction force of said compression coil spring at an intermediate position within the range of movement of said lid, said spring balancer including a fixed diameter friction ring fixed to one of said rod and said metallic cylinder to frictionally engage the other of said cylinder and said rod, respectively, so as to provide a friction force when said rod transfers in the axial direction.

4,457,498

FORCE BALANCED DIE CYLINDERS

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Filed Apr. 27, 1982, Ser. No. 372,121
Int. Cl.³ F16F 9/02
U.S. Cl. 267—130 **6 Claims**



1. A force balanced die cylinder comprising:

a cylinder housing having a bore passing therethrough between a first top end which is closed by a closure means provided with a smaller central opening therein including a seal adaptable of receiving slidably a piston rod passing therethrough of a large coaxial piston, said piston rod inside said bore comprising an annulus therebetween, and a second bottom end thereof provided with a diametral relief which is open and adaptable to be closed by said piston with seals of U-cup configuration of which seal channels facing said diametral relief are positioned inside peripheral grooves of said piston so as to expose said channels to a working fluid pressure of 1000 to 5000 pounds per square inch constantly acting over a piston face, opposite a piston underside facing said annulus, with a force large enough to keep said seal channels pressure tight against the walls of said bore during piston position change therein from a second piston rod extended position when said piston rod is moved by a ram force of a punch press in direct contact therewith for cushioning a blow thereof against said working fluid pressure said piston face experiences until said piston bottoms at said cylinder second bottom end provided with said diametral relief allowing working fluid to enter said piston underside,

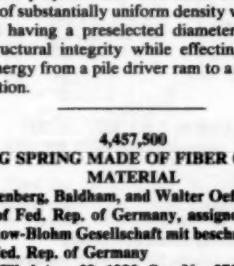
to a first piston rod retracted position of a very short duration before said ram force becomes removed from said piston rod facilitating an instant pressure loading of said piston underside for a substantially force balanced piston return to said second piston rod extended position until said ram blow becomes re-applied to said piston rod again, and vice-versa, including means for unloading said piston underside due to existance of force differential generated by different surface areas of said piston face versus said piston underside, provided with said piston rod, both exposed to a working fluid under high pressures exhibiting desired piston movement at considerably slower speed from said first to said second positions, not attainable by more complicated devices of prior art operated by compressible fluids such as gas.

4,457,499

PILE DRIVER CUSHION

Peter Townsend, Forked River, N.J., assignor to Metex Corporation, South Plainfield, N.J.

Continuation-in-part of Ser. No. 115,342, Jan. 25, 1980, Pat. No. 4,340,210. This application Dec. 23, 1981, Ser. No. 333,640
The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.
Int. Cl.³ F16F 7/00
U.S. Cl. 267—137 **2 Claims**



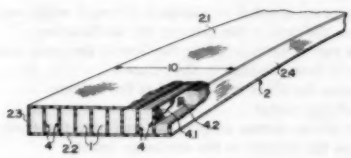
1. A pile driver cushion for effecting the controlled transfer energy from a pile driver ram to a pile during the operation of a pile driver comprising a pad formed from knitted mesh including knitted polymer and wire mesh compressed into a flexible strip of substantially uniform density wound upon itself into a spiral having a preselected diameter and secured to retain its structural integrity while effecting the controlled transfer of energy from a pile driver ram to a pile during a pile driver operation.

4,457,500

BENDING SPRING MADE OF FIBER COMPOUND MATERIAL

Franz Drachenberg, Baldham, and Walter Oefner, Mitterdarching, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Apr. 28, 1982, Ser. No. 372,562
Claims priority, application Fed. Rep. of Germany, May 19, 1981, 3119856
Int. Cl.³ F16F 1/36, 1/18; B62B 5/12; B29H 7/04
U.S. Cl. 267—148 **10 Claims**



1. In a bending spring having a wide side of given width and a narrow side defining a spring thickness smaller than said given width, said bending spring being made of fiber compound materials including unidirectionally oriented reinforcing fibers (1) embedded in a fiber bonding mass, said wide side defining a surface for a load application perpendicularly to said wide side of said bending spring, the improvement comprising thin fiber layer inserts (4, 5) for transverse stress relief, said thin inserts dividing said bonding mass and unidirectional reinforcing fibers (1) into sections wider than said thin fiber layer inserts, said thin fiber layer inserts extending substantially entirely through said bending spring from wide side to wide side and being spaced from one another along said given width of the bending spring, said thin fiber layer inserts (4, 5) having a fiber orientation extending mainly perpendicularly relative to said wide side of said bending spring and hence substantially in parallel to the direction of load application, and also substan-

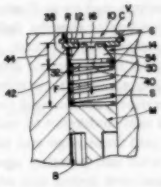
tially in parallel to the narrow side of the spring for relieving said bonding mass of transverse stress components resulting from bending said spring.

4,457,501

ADJUSTABLE SPRING SEAT

Alan R. Davis, Plainwell, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 2, 1982, Ser. No. 404,250
Int. Cl.³ F16F *1/12*
U.S. Cl. 267—177 **9 Claims**



1. An adjustable spring stop assembly for a coil spring received within a bore, said assembly comprising:

a generally flat disk shaped washer member axially fixed in said bore, said washer member having a generally centrally located aperture therethrough and a plurality of radially extending, radially aligned slot pairs formed therethrough, each of said slot pairs of a different diametrical length and of a generally equal width; and

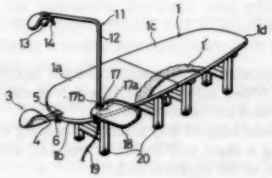
a one piece adjustment member having a generally flat, partially disk shaped base portion and a pair of ear portions extending axially from one side of said base portion, the thickness of said ear portions being equal to or less than the width of said slots, the radially outer surfaces of said ear portions tapering radially inwardly with increased distance from said base portion, said ear portions receivable in any selected one of said slot pairs, the maximum transverse separation of said radially outer surfaces measured on a plane normal to the axis of said bore being at least equal to the diameter of the longest slot pair, the minimum transverse separation of said radially outer surfaces, measured on a plane normal to the axis of said bore, being less than the diameter of the shortest slot pair, the other surface of said base portion adapted to seat one end of said spring.

4,457,502

SIMPLE DENTAL SERVICE EQUIPMENT

Raymond D. Beach, Shizuoka, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Japan

Continuation of Ser. No. 265,171, May 19, 1981, abandoned.
This application Aug. 25, 1983, Ser. No. 526,223
Claims priority, application Japan, May 28, 1980, 55/74378[U]
Int. Cl.³ A61G *13/00*
U.S. Cl. 269—11 **2 Claims**



1. A simple dental service equipment comprising:

(a) a dental examination bed including a forward portion and a rearward portion, with both portions being connected in mutually collapsible relationship with each other and defining a substantially flattened upper surface;

(b) the forward edge and rearward edge of the bed being each curved into an arc shape;

(c) a headrest detachably mounted to the forward edge;

(d) a substantially L-shaped supporting means for supporting a light projector;

(e) tightening means rigidly attached to one side of a lower portion of the L-shaped supporting means, to removably attach the supporting means to the forward portion of the dental examination bed;

(f) a light projector carried at an upper end of the L-shaped supporting means disposed generally above the headrest;

(g) an annular shaped tray supporting member having one side attached to the L-shaped supporting means adjacent the lower portion thereof such that the supporting member extends from the L-shaped supporting member in a direction opposite from the tightening means; and

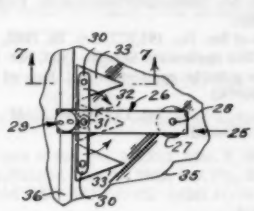
(h) tray holding means attached to and disposed above the tray supporting member and extending inwardly toward its center such that the edge of a dental tray may be inserted between the tray supporting member and the tray holding means to hold the tray stationary by its own gravity and extending in a direction away from the examination bed.

4,457,503

SUCTION CLAMP

Donald R. Connor, 448 Burnet Ave., Syracuse, N.Y. 13203

Filed Mar. 10, 1982, Ser. No. 356,795
Int. Cl.³ B25B *11/00*
U.S. Cl. 269—21 **1 Claim**



1. A suction clamp, comprising, in combination, an elongated main body, a suction cup secured under one end of said main body by a fastener, a bolt through an opposite end of said main body having a rubber foot on a lower end of said bolt and a knob on an upper end thereof, and a second fastener through said main body being located between said suction cup and said bolt, said second fastener being relatively close to said bolt, a pair of independently pivotable arms on an underside of said main body each being pivoted at one end on said second fastener, and a triangular suction cup under an opposite end of each said pivotable arm while a third triangular suction cup is supported on a lower end of said second fastener, wherein said independently pivotable arms and said triangular suction cups permit positioning of said suction clamp in the corner of windows.

4,457,504

COLLAPSIBLE/KNOCKDOWN SAWBUCK

Gilbert E. Mottla, 173 Mill La., Amherst, Mass. 01002

Filed Aug. 23, 1982, Ser. No. 410,322
Int. Cl.³ B23Q *3/00*
U.S. Cl. 269—296 **5 Claims**

1. A collapsible/knockdown sawbuck for positioning and sawing wood comprising in combination:

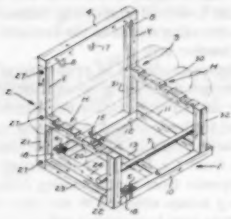
(a) a base;

(b) a first work support having an L-shape;

(c) pivot means for permanently connecting said first work

support to said base whereby said base and said first work support are collapsible from an operative position, with said first work support extending upwardly, perpendicular to said base, to a storage position, with said base in spaced parallelism with said first work support to define a storage space therebetween;

(d) a second work support having an L-shape;



(e) anchor means for detachably connecting said second work support in operative position to said base with the second work support spaced from and parallel to said first work support, and said second work support being received in said storage space when said base and first work support are collapsed to said storage position.

4,457,505

WEB LAYING APPARATUS

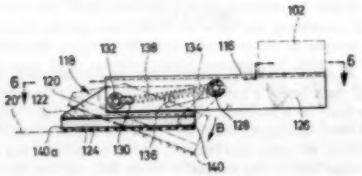
Rolf Jung, Waiblingen, and Walter Wienen, Fellbach, both of Fed. Rep. of Germany, assignors to Krauss u. Reichert GmbH & Co. KG Spezialmaschinenfabrik, Fellbach, Fed. Rep. of Germany

Division of Ser. No. 191,822, Sep. 26, 1980, Pat. No. 4,381,859. This application Sep. 30, 1982, Ser. No. 432,371

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009748

Int. Cl.³ B65H *29/46*

U.S. Cl. 270—30 **4 Claims**



1. In a web laying machine including a laying table; a laying carriage arranged for back-and-forth travel along the laying table; drive means for propelling the laying carriage; a web laying unit mounted on said laying carriage for laying web on the laying table during the travel of said laying carriage; and a web holding unit arranged at an end of the laying table for grasping and immobilizing the web while said web laying unit deposits a web length on said laying table; the improvement wherein said web holding unit includes

(a) a carrier;

(b) a web holding element having an underside for engagement with the web; said underside having a first and a second edge extending transversely to a length dimension of said laying table, said first edge and said second edge being a rear edge and a front edge, respectively, as viewed from said laying carriage; said web holding element further having a front portion containing said front edge and a rear portion containing said rear edge;

(c) mounting means for supporting said web holding element on said carrier for pivotal motion onto the web for effecting engagement between the web and said underside; said mounting means having

(1) first securing means pivotally and slidably attaching said front portion to said carrier;

(2) second securing means indirectly attaching said rear portion to said carrier;

(d) force-exerting means operatively connected between said web holding element and said carrier for urging said web holding element into an oblique position in which said rear edge is closer to said laying table than said front edge;

(e) means for movably supporting said carrier for a linear displacement towards and away from said laying table in a direction perpendicular thereto, between a withdrawn position and an operative position; in said withdrawn position said carrier being remote from said laying table and said web holding element assuming said oblique position; in said operative position said carrier adjoining said laying table and said underside of said web holding element, including said front edge and said rear edge, being in engagement with and pressing against a web portion which has left said web laying unit and which is situated on said laying table; and

(f) means for moving said carrier into and out of said withdrawn and operative positions; said web holding element, in the course of motion of said carrier into said operative position, first engages the web on the laying table with said rear edge of said underside and, upon continued approach of said carrier to said operative position, pivots about said rear edge without displacement thereof in a direction parallel to said laying table, for effecting engagement between said front edge of said underside and the web on the laying table.

4,457,506

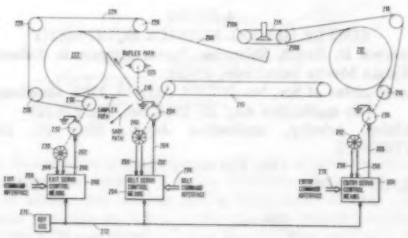
SERVO-CONTROLLED AUTOMATIC DOCUMENT FEEDER

William H. Ashbee, Boulder; Mark A. Beran, Niwot; Donald F. Colglazier, Longmont; Donovan M. Janssen; John P. Mantey, both of Boulder; Ronald J. Martin, Loveland; Gerald P. Patch; Larry E. Rittenhouse, both of Boulder, and James A. Valent, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 16, 1981, Ser. No. 302,877

Int. Cl.³ B65H *5/22, 31/12*

U.S. Cl. 271—3.1 **9 Claims**



7. A recirculating automatic document feeder for use with a document copier machine operable to feed sheets to be copied to a document platen comprising:

a document support tray means for holding a stack of sheets having a sheet exit station at one end and a sheet input station at the opposite end;

entry turnaround sheet transport means connected to receive a sheet from said exit station and deliver said sheet to said document platen;

document platen sheet transport means connected to receive a sheet from said entry turnaround means and to move

said sheet across said document platen to position said sheet for a copying operation;

exit turnaround sheet transport means connected to receive a sheet from said document platen sheet transport means and deliver said sheet to said sheet input station;

first motive means for driving sheets through said entry turnaround means;

second motive means for driving sheets through said document platen sheet transport means;

third motive means for driving sheets through said exit turnaround means; and

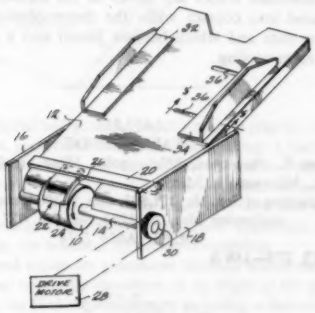
control means for controlling the first, second and third motive means to enable independent operation of each of the sheet transport means one from another and to enable sheet speed synchronization of at least two of said sheet transport means at a time when said sheet is interchanged from one of said sheet transport means to another of said sheet transport means.

4,457,507

SHEET FEEDING APPARATUS

Masaaki Ishikawa, Hino, and Michihisa Iguchi, Komae, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Dec. 18, 1981, Ser. No. 332,156
Claims priority, application Japan, Dec. 20, 1980, 55-180954
Int. Cl.³ B65H 3/52
U.S. Cl. 271—121 7 Claims



1. Apparatus for singly feeding sheets of paper from a stack comprising:

guide means for positioning the stack, said guide means including a fixed guide element and an adjustable guide element defining a medial line equidistant from said fixed and adjustable guide elements;

a rotatable roller fixed in position so that the center of said roller length is disposed from said medial line toward said fixed guide when said adjustable guide is at a maximum distance from said fixed guide; and

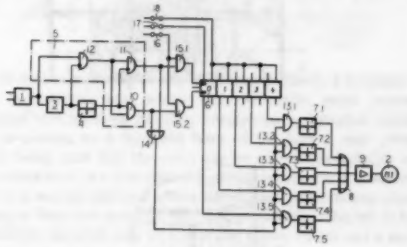
means, cooperating with the roller, for limiting the number of sheets frictionally engaging said roller to one at a time, said limiting means being fixed in position so that said medial line passes through said limiting means when said adjustable guide is at a maximum distance from said fixed guide.

4,457,508

STACK CONTROL APPARATUS FOR SHEET FEEDERS

Volker Eichler, Weinboehla, German Democratic Rep., and Werner Lein, deceased, late of Radebeul, German Democratic Rep., by Annelies Lein, heir, assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed May 8, 1981, Ser. No. 261,708
Int. Cl.³ G05B 17/24; B65H 1/18
U.S. Cl. 271—152 16 Claims



1. A stack height control apparatus for sheet feeders in sheet processing machines, comprising stack height sensing means; a divider connected to the stack height sensing means; a comparison timing stage connected to the divider; a comparator stage connected to the sensing means, to the divider and to the comparison timing stage; a forward-backward shift register connected to the comparator stage; at least two timing stages each connected to the shift register and to the comparator stage; and a stack lift motor associated to the timing stages.

4,457,509

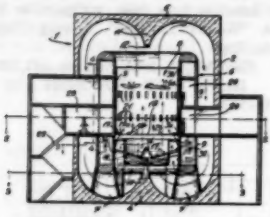
LEVITATIONARIUM FOR AIR FLOTATION OF HUMANS

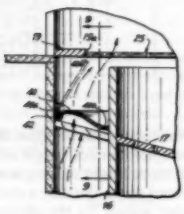
Jean St-Germain, St. Simon, Canada, assignor to Airflite, Inc., Las Vegas, Nev.

Continuation-in-part of Ser. No. 240,811, Mar. 5, 1981, abandoned. This application May 24, 1982, Ser. No. 381,594
Int. Cl.³ G01M 9/00; A63B 71/02; A63G 31/16
U.S. Cl. 272—2 16 Claims

1. A levitationarium for air flotation of humans comprising a housing having an inner wall defining a levitation chamber, said levitation chamber defining a central vertical axis and having an air inlet at the lower end thereof and an air outlet at the upper end thereof, shroud means supported within said housing proximate said lower end of said chamber with blower means arranged therein for propelling air upwardly through said shroud means and said chamber, said shroud means having an air inlet at the lower end thereof and an air outlet at the upper end thereof communicating with said air inlet of said chamber whereby said propelled air flow can be established, said shroud means being spaced from said inner wall an amount sufficient to cause a flow of air by the operation of said blower means resulting from both the blower means operation in driving air and an induced suction flow being produced in the space around said shroud whereby an enhanced air flow is generated in said chamber, flow directing means arranged in said shroud above said blower means for inwardly directing the flow produced by the driving of air by said blower means toward said axis of said chamber, grating means extending transversely across the lower end of said levitation chamber above said shroud means for simultaneously allowing upward air flow created by said blower means to pass therethrough and for supporting standing users of said levitationarium thereon, annular platform means extending peripherally around said inner wall of said levitation chamber and which is air impervious for permitting users to stand clear of said upward air flow and from which users can dive toward the center of said chamber for being lifted by said upward air flow, and deflector

means arranged below said annular platform means and movable between an operating position and a non-operating position whereby when said blower means is in operation, said





deflector means is forced into said operating position for deflecting air flow away from said platform means to prevent air turbulence in proximity thereto.

4,457,510

EXERCISING APPARATUS

Daniel M. Pertschuk, 1349 Camino Del Mar, Del Mar, Calif. 92014

Filed Sep. 13, 1982, Ser. No. 416,924
Int. Cl.³ A63B *23/02*
U.S. Cl. 272—93 **11 Claims**

1. Exercising apparatus, comprising:

(a) a pair of socks having on their soles a first pair of loop-type Velcro patches, each sock being an elastic foot supporter with an open toe and an open heel and corrected bands around foot and ankle, and

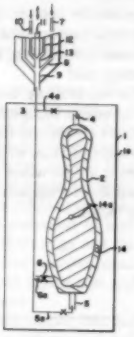
(b) a flexible carpet-like panel adapted to detachably abut and secure to a vertical surface such as a wall in flat condition in use and to roll for transportation and fastener means operative to secure said panel to said vertical surface, a second pair of spaced-apart, juxtaposed hook-type Velcro patches secured to the face of said panel to detachably secure to said first pair of Velcro patches, whereby the exercising apparatus can be used in bent-knee situps to secure the feet to said vertical surface above the floor level.

4,457,511

PLASTIC BOWLING PIN AND METHOD OF MAKING THE SAME

William Witkowski, 909 Troupe Rd., Harborcreek, Pa. 16421

Filed Mar. 15, 1982, Ser. No. 358,339
Int. Cl.³ A63B *63/00*; B29D *27/00*
U.S. Cl. 273—82 R **9 Claims**



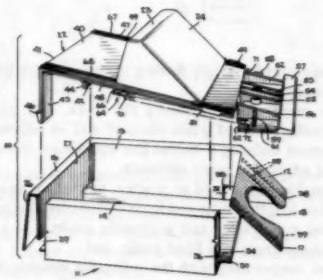
1. A bowling pin having a central core of a mixture of thermoplastic and a foaming agent surrounded by a hollow discrete skin of thermoplastic per se, and having been made by a process wherein both the core mixture and the thermoplastic per se are coinjected while in conforming contact and while the thermoplastics are in a heated and viscous state and coinjected under pressure in a mold cavity having the shape of a bowling pin, the outer surface of the thermoplastic per se being in contact with the mold cavity and the outer surface of the mixture being in contact with the inner surface of the thermoplastic per se, the thermoplastic per se and mixture being distinct materials which are united at the surfaces which are pressured into contact while the thermoplastics are in the viscous state and which become joined into a unitary rigid body upon cooling.

4,457,512

DEALING SHOE

Richard L. Stevenson, Minneapolis, Minn., assignor to Jax, Ltd., Minneapolis, Minn.

Continuation of Ser. No. 271,883, Jun. 9, 1981, abandoned. This application Mar. 25, 1983, Ser. No. 477,592
Int. Cl.³ A63F *1/14*
U.S. Cl. 273—148 A **15 Claims**



1. A dealing shoe for playing cards comprising:

a box having a sloping front wall with a finger opening therein communicating with a slot horizontally disposed

at a lower edge of said front wall for passage of cards therethrough;

a support disposed in said box, said support having a flat plate with closed guide slots extending from a front end of said flat plate to a rear end of said flat plate to define a bendable rail along each respective slot, said flat plate extending downwardly from said rear wall of said box towards said front wall;

a pusher slidably mounted on said support, said pusher having a sloping front surface and projections extending through said guide slots in said flat plate, each projection having a width below said flat plate greater than a width of a respective guide slot for releasably retaining said pusher on said support; and

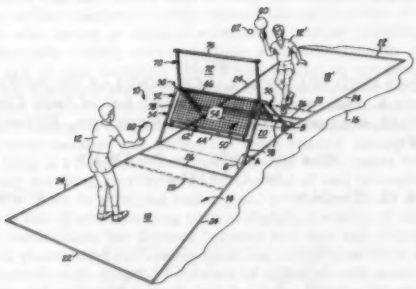
means for resiliently biasing said pusher toward said front wall of said box.

4,457,513

REBOUND BALL GAME AND APPARATUS THEREFOR

Richard B. Thompson, 264 Beverly Hills Rd., Fort Lee, N.J. 07024

Filed Mar. 10, 1983, Ser. No. 474,167
Int. Cl.³ G09B *71/02*
U.S. Cl. 273—411 **18 Claims**



1. In a rebound ball game in which opposed players return a ball within a prescribed court extending along a horizontal playing surface in opposite longitudinal directions from a rebound apparatus located on the playing surface between the players such that the court is divided into first and second opposed playing areas with the rebound apparatus placed therebetween, the rebound apparatus comprising:

first rebound means for placement laterally across the court to extend upwardly therefrom at an angle to the playing surface, the first rebound means including a first rebound face for confronting the first playing area and making an angle therewith such that upon reception of the ball from the first playing area the first rebound means will rebound the ball toward the first playing area;

second rebound means for placement laterally across the court to extend upwardly therefrom at an angle to the playing surface, the second rebound means including a second rebound face for confronting the second playing area and making an angle therewith such that upon reception of the ball from the second playing area the second rebound means will rebound the ball toward the second playing area; and

return area means between and extending upwardly above the first and second rebound means for defining an open, generally vertical return area of prescribed dimensions through which the ball is to be passed upon return of the ball from one of the first and second playing areas to the other of the first and second playing areas.

4,457,514

DARTS

Colin J. Paxman, 5 Fieldings Rd., Cheshunt, Hertfordshire EN8 9TL, England

Filed Sep. 30, 1982, Ser. No. 432,363
Int. Cl.³ A63B *65/02*
U.S. Cl. 273—420 **3 Claims**

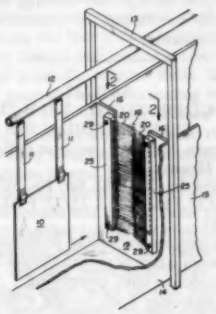
2. A dart comprising an elongate barrel which is longitudinally asymmetric and which has two ends; point means mounted in a securing member comprising a threaded collar for connection to a threaded bore of the barrel, said point means being such that the point can be secured detachably to a threaded bore in a first said end of the barrel or to a threaded bore in a second said end of the barrel, said point means comprising at least two points, a first said point being adapted to be detachably secured only to a first end of the barrel and a second said point being adapted to be detachably secured only to the second end of the barrel; shaft means with a threaded end for connection to the barrel, said shaft means being such that said threaded end can be secured detachably to said threaded bore in the first end of the barrel or said threaded bore in the second end of the barrel, said shaft means comprising at least two shafts, a first said shaft being adapted to be detachably secured only to a first end of the barrel and a second said shaft being adapted to be detachably secured only to the second end of the barrel, and at least one flight adapted to be secured to any one of the shafts; and flight means adapted to be secured detachably to the other end of the said shaft means remote from the threaded end, the construction being such that a dart can be assembled having different characteristics with the point secured detachably to one said end of the barrel and a shaft and flight secured detachably to the other said end of the barrel, and, alternately, a point secured detachably to the said other end of the barrel, and a shaft and flight secured detachably to the said one end of the barrel.

4,457,515

BRUSH SEAL AND METHOD

Charles D. Eidschun, Clearwater, Fla., assignor to Micro-Plate, Inc., Clearwater, Fla.

Filed Jul. 27, 1981, Ser. No. 287,268
Int. Cl.³ E01G *5/16*; B05D *3/12*
U.S. Cl. 277—1 **16 Claims**



1. A brush seal for a gap defined by opposed baffles at the end of processing chamber comprising, in combination,

said process chamber having means for spraying fluid on vertically disposed printed circuit boards,

conveyor means for suspending printed circuit boards for horizontal transport through said chamber,

a pair of opposed brush assemblies,

each brush assembly having a rectilinear header securing a plurality of bristle clusters within the header and with the ends of the bristles exposed equidistant opposite the header,

and elongated mounting means unitary with the header so that when the headers are secured to the baffles between a pair of chambers the brushes in opposed relationship will angle forwardly according to the path of travel of the workpiece to be cleaned.

4,457,516

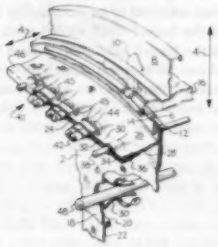
UNIVERSAL SLEEVE

Samuel R. Herman, Cypress, and Louis B. Fischer, Tustin, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Apr. 1, 1982, Ser. No. 364,431

Int. Cl.³ F16L *5/00, 3/22;* **F16J** *15/00;* **B65D** *53/00*

U.S. Cl. 277—12 **2 Claims**



1. A universal sleeve for use in an opening in an air recirculation barrier to surround penetrating components and limit the flow of air around the components thru the barrier comprising:

a flexible flap attached to said recirculation barrier and positioned in the opening of said barrier said flap having an opening therein closed by two edges, and

hook and pile tapes located along the facing edges of said flap to engage each other and seal the opening in said barrier and seal said flap around the penetrating components, and small eyelet openings located in the edge of said flap and in said hook and pile tapes on the edge of the flap, and

Tie straps to pass through said openings and hold the taped edges closely surrounding the circumference of the penetrating components.

4,457,517

PIPE FLANGE PROTECTOR WITH ELASTOMERIC SELF-CENTERING RIB

Ronald G. Dunegan, Katy, Tex., assignor to Rodun Development Corporation, Houston, Tex.

Filed Jul. 22, 1983, Ser. No. 515,989

Int. Cl.³ F16J *15/12, 15/32;* **F16L** *11/12*

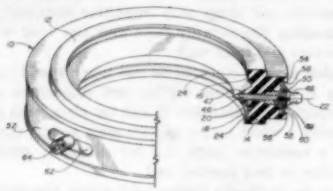
U.S. Cl. 277—12 **15 Claims**

1. A flange protector for sealing protecting a flange gasket interposed between a pair of spaced flanges from the environment with a protective fluid, comprising:

an elongate elastomer body having a pair of tapered end surfaces and adapted for forming a ring-shaped member for sealing engagement with each of said spaced flanges;

said elastomer body having a selected cross-sectional configuration throughout at least a substantial length of said elastomer body for independently withstanding the maximum anticipated pressure of said protective fluid and maintaining said elastomer body in sealing engagement with each of said spaced flanges;

latching means for securing together said tapered end surfaces when said body is placed about said pair of spaced flanges;



valve means for passing said protective fluid through said elastomer body and into engagement with said flange gasket and maintaining said protective fluid under pressure; and

relief valve means for automatically relieving protective fluid pressure in excess of said maximum anticipated pressure.

4,457,518

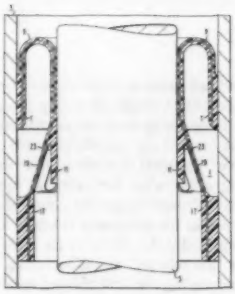
INFLATED SEAL FOR LARGE ANNULAR OPENINGS

Jerry K. Endo, and Jeffrey P. Connell, both of Santa Clara, Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 3, 1983, Ser. No. 538,319

Int. Cl.³ F16J *15/46*

U.S. Cl. 277—34.3 **6 Claims**



1. A seal for a large annular opening between two generally cylindrical surfaces, said seal comprising:

a first base portion in the form of a ring affixed to one of these cylindrical surfaces;

an arcuate toroidal shaped portion extending from the first base portion in such a manner that a concave side thereof is disposed on a high pressure side of said seal;

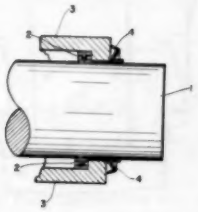
a second base portion in the form of a ring affixed to said one cylinder on the high pressure side of the first base portion; and

ribbons of high strength material spaced on a predetermined circumferential pitch extending between said first and second base portions and embedded therein to form a compliant seal which will not invert and with substantial self-centering characteristics.

4,457,519
SEALING RING

George H. Harrington, 162 Graeser Ave., Bethel Park, Pa. 15102

Continuation-in-part of Ser. No. 859,662, Dec. 12, 1977. This application Jun. 4, 1982, Ser. No. 385,552
Int. Cl.³ F16J *15/38*
U.S. Cl. 277—65 5 Claims



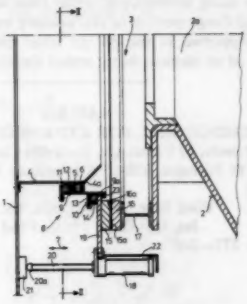
1. An annular seal of resilient material for effecting a seal between a stationary member and a rotary shaft extending through said stationary member in a direction substantially perpendicular to a surface of said stationary member, said seal when relaxed, having a cylindrical mounting portion with a cylindrical passageway formed therethrough of slightly less diameter than said rotary shaft defining an elongated annular inner surface adapted to tightly embrace the outer surface of a shaft, also having an integral intermediate portion extending substantially radially outwardly from a position inwardly of one end of said mounting portion and having an extremity portion extending angularly at least 90° relative to said intermediate portion toward said stationary member and terminating in a sealing lip adapted to provide sealing contact with said stationary member, said sealing lip, when relaxed, having an end lying in a first radial plane perpendicular to the center line of said mounting portion, and said one end of said mounting portion lying in a second radial plane perpendicular to the center line of said mounting portion slightly inwardly of said first radial plane, the distance between said first and second radial planes being sufficiently great that centrifigual force at excessively high speeds of rotation of said shaft will always rotate said sealing lip towards said stationary member insuring a positive seal, whereby when said one end of said mounting portion is positioned on said shaft tightly against said stationary member, a tight fit is effected between the surface of said shaft and said annular inner surface of said mounting portion and whereby said intermediate and extremity portions are flexed to retain said seal in position on said shaft to that said lip constantly remains in sealing engagement with said stationary member irrespective of centrifugal force from rotation of said shaft.

4,457,520
DEVICE FOR SEALING THE GAP BETWEEN A ROTARY KILN AND AN INLET HOUSING

Heinz Grachtrup, Ennigerloh, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Mar. 24, 1982, Ser. No. 361,425
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114695
Int. Cl.³ F16J *15/38;* F27B *7/24*
U.S. Cl. 277—85 10 Claims

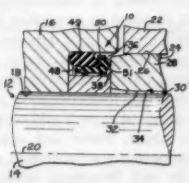
1. In a device for sealing the gap between the inlet end of a rotary kiln and a stationary inlet housing having a stationary feed tube, a first wear ring carried by said kiln for rotation therewith, a second wear ring confronting said first wear ring for sealing engagement therewith, means mounting said second wear ring on said feed tube for axial movement relative to said first wear ring, and yieldable means urging said second wear ring into engagement with said first wear ring, the improvement wherein said mounting means comprises at least two concentric, telescopic ring elements the inner one of which encircles said feed tube and the outer one of which is fixed to said second wear ring, each of said ring elements being movable axially relative to said feed tube.



4,457,521
REINFORCED TRACK PIN ASSEMBLIES AND SEALS THEREFOR

James P. Morley, Arlington Heights, Ill., assignor to CR Industries, Elgin, Ill.

Filed Nov. 5, 1979, Ser. No. 91,250
Int. Cl.³ F16J *15/38, 15/34*
U.S. Cl. 277—92 6 Claims



1. An end face seal unit for use in severe service environments, said assembly comprising, in combination, a primary annular sealing ring having a generally axially extending flange portion and a generally radially extending flange portion, said axial flange having respective inner and outer diameter surfaces and said axial flange having generally radially extending front and rear surface portions, said front surface portion of said radial flange having a portion thereof adapted to engage a mating surface in snug end face sealing engagement therewith when urged axially toward said mating surface, a secondary sealing member of generally annular form, said secondary member including generally axially extending inner and outer diameter surfaces and front and rear surface portions, said front and rear surfaces having at least portions thereof inclined forwardly and inwardly such that said secondary member, in the unstressed condition thereof, has a generally parallelogram shaped cross section, and a stiffening insert member of generally L-shaped cross section and having radial and axial flange portions, said insert member having the front face of its radial flange abutting said rear surface of said radial flange of said primary seal ring, and said insert axial flange overlying and confining the radially outer edge of said primary seal ring radial flange, said inner diameter of said secondary member being received in use over said outer diameter of said axial flange portion of said primary seal ring, with at least a portion of said front surface of said secondary seal member engaging at least a portion of the rear surface of said stiffening insert member, said primary member being made from a relatively stiff but

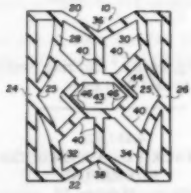
resilient first elastomeric material, said secondary member being made from a second resilient elastomeric material which is substantially less stiff than said first material, and said insert member being substantially stiffer than said primary member, said axial flange portion of said primary member being adapted to be supported in use on the inner diameter thereof by a portion of an element being sealed thereby.

4,457,522

BRIDGE SEAL FOR EXPANSION GROOVES

Mario Trieste, 37 Variek Ct., Rockville Centre, N.Y. 11570, and John D. Nicholas, 835-16 A Broadway Ave., Holbrook, N.Y. 11741

Filed Mar. 24, 1983, Ser. No. 478,233
Int. Cl.³ E01C *11/10*; F16J *15/10*
U.S. Cl. 277—205 **4 Claims**



1. A sealing device for a clearance space of a comparatively large extent between two facing operative members, said sealing device being formed as an extruded elastomeric body having a wall construction of generally rectangular shape in cross-section comprising, in combination, an arrangement of functional walls disposed in respective locations as an upper wall, a lower wall, and a pair of opposing side walls bounding said rectangular cross-sectional shape, additional angularly oriented functional walls operatively arranged to retain a corner shape in each of said four corners of said rectangular cross-sectional shape disposed at each said corner bounded by intersections of said upper, lower and opposite side functional walls, and a cooperative arrangement of internally located support walls for said functional walls consisting of plural walls in circumferentially spaced relation connected to extend radially from said functional walls towards a location centrally of said rectangular cross-sectional shape, an elongated hexagonal-shaped wall arrangement in said rectangular cross-sectional shaped central location in connected relation to said plural walls so as to stabilize the normal positions thereof and having opposite pointed corners in a horizontal plane thereof and V-shaped indentations in said opposite walls in facing relation to said pointed corners to receive said pointed corners in seated relation therein, whereby in response to external forces, said hexagonal-shaped wall arrangement flattens out into said V-shaped indentations during the collapsing in size of said seal.

4,457,523

TORSIONALLY FLEXIBLE METALLIC ANNULAR SEAL

Horace P. Halling, Laurel, and Robert A. Barrett, Crofton, both of Md., assignors to Pressure Science Incorporated, Beltsville, Md.

Filed Oct. 29, 1982, Ser. No. 437,869
Int. Cl.³ F16J *15/08*
U.S. Cl. 277—236 **25 Claims**

1. A resilient, metallic sealing ring comprising:

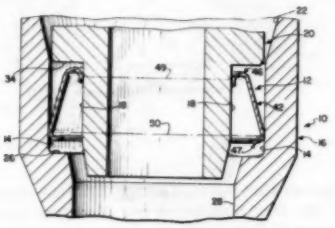
a central tapering annular portion having first and second ends;

a first annular sealing portion extending from said first end of said central portion, terminating in a free annular edge and being arcuate in cross section; and

a second annular sealing portion extending from said second end of said central portion, terminating in a free annular edge and being arcuate in cross section,

said central portion being upwardly and inwardly tapering from said second end to said first end,

said first and second annular sealing portions defining, respectively, first and second annular sealing lines which are



located in spaced, parallel planes that are perpendicular to the longitudinal axis of said central tapering annular portion,

said first annular sealing line facing radially inwardly of said central tapering annular portion,

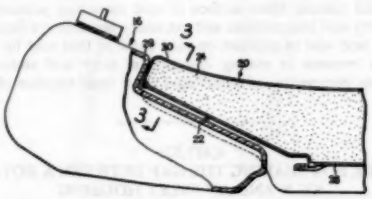
said second annular sealing line facing radially outwardly of said central tapering annular portion.

4,457,524

MOTORCYCLE SEAT

Tomomasa Yoshiwara, Fukuroi, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 16, 1981, Ser. No. 254,744
Claims priority, application Japan, Apr. 18, 1980, 55-51999
Int. Cl.³ B62K *11/04, 19/30*
U.S. Cl. 280—5 A **6 Claims**



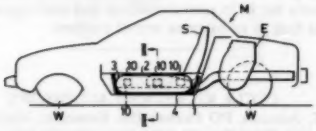
1. A seat construction for a motorcycle of the type having a frame with a head pipe, a tank rail and a seat rail joined to from a supporting structure, a fuel tank mounted to said tank rail having a upper surface, and a seat with a rearwardly-extending rear end, said rear end being mounted to said seat rail, characterized in that: said upper surface of said tank is formed with an upwardly and rearwardly facing recess with a substantial length forward of the rear end of the tank, said seat includes a forwardly projecting front end extending into and seated in said recess, with its top at about the same level as the top of said tank so as to form no appreciable step, said rear end projecting a substantial distance rearwardly of said tank, and attachment means disposed between said seat and said tank to retain said seat to said tank.

4,457,525

VEHICLE BODY FLOOR CONSTRUCTION OF MOTOR VEHICLES

Yasushi Tanaka, and Shigeru Moriya, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 11, 1982, Ser. No. 387,369
Claims priority, application Japan, Jun. 12, 1981, 56-86602[U]
Int. Cl.³ B60K *15/02*
U.S. Cl. 280—5 A **10 Claims**



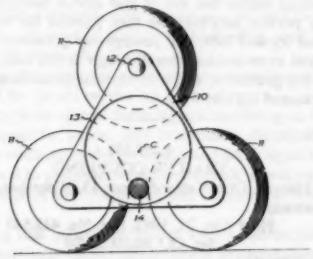
1. A vehicle body floor construction of a motor vehicle, wherein a tunnel upwardly projecting from the surface of a floor panel, downwardly opening and disposed in the longitudinal direction of the vehicle is formed at the central portion in the widthwise direction of said floor panel, a fuel tank is disposed in said tunnel, and a protector is disposed in a manner to block the bottom opening of said tunnel at least within a range of the fuel tank and connected to said floor panel at opposite sides of said opening.

4,457,526

WHEEL ASSEMBLY

Kjell O. Persson, P1 2127, S-280 10 Sösdala, Sweden

PCT No. PCT/SE81/00293, § 371 Date Jun. 8, 1982, § 102(e) Date Jun. 8, 1982, PCT Pub. No. WO82/01356, PCT Pub. Date Apr. 29, 1982
PCT Filed Oct. 9, 1981, Ser. No. 387,875
Claims priority, application Sweden, Oct. 10, 1980, 8007101
Int. Cl.³ B62B *5/02*
U.S. Cl. 280—5.26 **3 Claims**



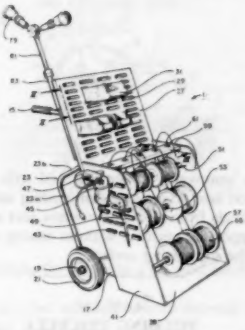
1. A wheel assembly comprising:
a holder;
a least three wheels rotatably mounted on the holder equidistantly around the periphery thereof;
a circular bearing means rotatably carried by the holder and having its center axis coincident with the axis of rotation of the holder; and
a frame connected to the circular bearing means at a radial distance from the center of the bearing means.

4,457,527

UTILITY CART

A. J. Lowery, 867 Sandell, White Settlement, Tex. 76108

Filed Dec. 3, 1981, Ser. No. 327,172
Int. Cl.³ B62B *1/26*
U.S. Cl. 280—47.19 **8 Claims**



1. In a utility cart of the type having a frame mounted on an axle on a pair of wheels, the cart having a base plate projecting forwardly of the axle and positioned to contact the ground and support the cart in an upright position, the cart having a rearwardly extending handle for tilting the cart about the axle and moving the cart, the improvement comprising:
a back plate mounted across the frame, the back plate having a plurality of retaining means for releasably retaining bins for storing material;
a pair of spaced-apart side plates extending forwardly from the back plate, the side plates having a plurality of retaining means for releasably retaining goods; the side plates extending upwardly from the base plate in planes perpendicular to the back plate and to the base plate;
at least one bracket mounted to the inside surface of each side plate;
a shaft extending between the brackets parallel with the axle for holding spools of cord;
the frame having a pair of parallel rigid braces extending upwardly and rearwardly from the axle with respect to the back plate, the brace having a lower portion inclining rearwardly with respect to the frame and an upper portion extending forwardly and joining the frame;
a top plate extending forwardly from the back plate flush with the upper edges of the side plates;
a front plate connected by a hinge to the forward edge of the top plate and adapted to pivot between a closed position flush with the forward edges of the side plates and a horizontal open position; and
brace means for releasably supporting the front plate in the open position.

4,457,528

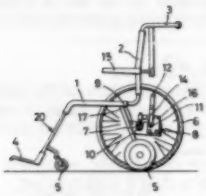
WHEELCHAIR

Kiyoshi Ichikawa; Hiroshi Tatsumi, both of Tokyo, and Minoru Ida, Osaka, all of Japan, assignors to Manten Co., Ltd., Osaka, Japan

Filed Jul. 26, 1982, Ser. No. 401,981
Claims priority, application Japan, Aug. 11, 1981, 56-119686[U]
Int. Cl.³ B62M *1/14*
U.S. Cl. 280—242 WC **3 Claims**

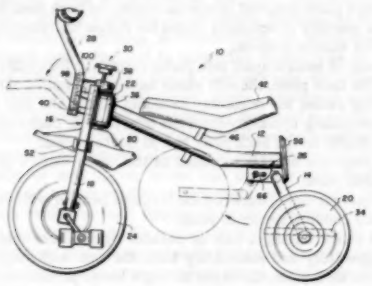
1. A wheelchair comprising:
a frame having a seat, a back, and legs and being sufficiently narrow in width to pass through an aisle in an airplane or a train;
a pair of auxiliary wheels fixedly mounted on said legs of

said frame at each side thereof and having a track narrow enough to pass through the aisle of the airplane or train;
an axle;
a pair of main wheels attached to each end of said axle with a track of sufficient width for stable travelling; and



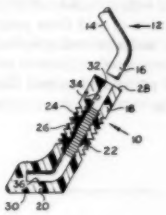
means for removably mounting said axle and said main wheels on said frame and demounting said axle and said main wheels from said frame when said main wheels are on a supporting surface, without raising said frame relative to the supporting surface.

4,457,529
FOLDING TRICYCLE
Louis Shamie, and Sam Shamie, both of 630 Avenue V, Brooklyn, N.Y. 11223
Filed Aug. 5, 1982, Ser. No. 405,377
Int. Cl.³ B62K *15/00*
U.S. Cl. 280—278 **12 Claims**



1. A folding tricycle comprising:
a main frame member;
a rear frame member pivotally connected to and adjacent a rear end of said main frame member for movement from a rearward operable position to a forward stored position;
a pair of rear wheels rotatably mounted to and adjacent opposite sides of said rear frame member, each having an inner surface;
a front fork having an upper portion and a pair of spaced downwardly extending prongs connected to said upper portion;
a front wheel rotatably mounted to and between said prongs on a first horizontal axis;
said upper portion of said fork being pivotally connected to said main frame member for pivotal movement to steer said front wheel and for movement into at least one extreme stored position;
first locking means connected to said main and rear frame members for locking said rear frame members into its operable position;
a handle bar pivotally connected to said upper portion about a second horizontal axis for movement from an upper operable position, said first and second axes being parallel to each other to a lower stored position; and
second locking means connected to said upper portion and said handle bar for locking said handle bar in its operable position;
said handle bar including a pair of handle portions extending outwardly, said handle portions having a length so that with said handle bar and said rear frame member in their stored positions and said upper portion of said fork in its extreme stored position, one of said handle portions engages under the inner surface of one of said rear wheels;
said handle bar comprising said pair of handle bar portions each with a handle at an end thereof and a cross bar connected between said handle bar portions at a location to engage said cross bar against said front wheel with said handle bar in its stored position, and said upper portion of said fork in its extreme stored position.

4,457,530
CYCLE KICKSTAND ACCESSORY
Clyde T. Johnson, PO Drawer 100, Escanaba, Mich. 49829
Filed Sep. 23, 1982, Ser. No. 421,962
Int. Cl.³ B62H *1/00*
U.S. Cl. 280—293 **6 Claims**

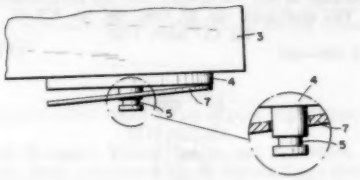


5. An accessory device for a kickstand including a kickstand leg, one extremity of said leg being provided with a foot section disposed at an obtuse angle to said leg, said device having a unitary body constructed of deformable material and including an elongated leg portion and a foot portion at one extremity of said leg portion disposed at an obtuse angle relative to said leg portion, said leg portion being provided with a flex section axially intermediate the one extremity of said leg portion where the foot portion is disposed and a second extremity of said leg portion longitudinally axially remote from said foot portion, said foot portion having a splayed exterior surface remote from said leg portion, said device being further provided with a longitudinal axial passageway coaxial with the longitudinal center-line axis of said device extending through said leg portion and into the foot portion for receiving the kickstand leg and foot, said passageway geometrically shaped in vertical cross-section therethrough in the same configuration as the geometric shape in vertical cross-section through said kickstand leg and foot.

4,457,531
TRAILER COUPLING
Walter Hünger, Otto-Nagler-Strasse 13, Wuerzburg, Fed. Rep. of Germany
Filed Aug. 31, 1982, Ser. No. 413,543
Int. Cl.³ B62D *53/08*
U.S. Cl. 280—433 **5 Claims**

1. A trailer coupling for use in coupling a trailer to a vehicle such as a tractor comprising:
a. a coupling plate mounted on said vehicle;
b. an anti-friction layer mounted to said coupling plate;
c. a slide plate mounted to said trailer;
d. a journal mounted to the trailer and operable for locking engagement with said coupling plate to secure said trailer and vehicle; and
e. an intermediate plate removably positioned between said slide plate and said anti-friction layer, said intermediate

plate having a smooth surface thereof contacting said anti-friction layer during coupling of said trailer and vehicle, said intermediate plate having a bore therethrough for permitting passage of said journal with minimal clearance,



tilting of said intermediate plate positioned on said journal with said minimal clearance providing the sole means for securing said intermediate plate to said journal whereby said intermediate plate is removably secured to said journal.

4,457,532

METHOD AND APPARATUS FOR THE ACTUATING BEHAVIOR OF SAFETY SKI BINDING

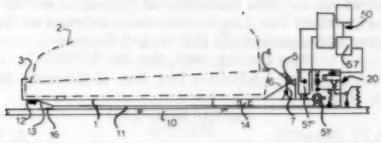
Walter Knabel, Farchant, Fed. Rep. of Germany, assignor to Marker-Patentverwertungsgesellschaft mbH., Baar, Switzerland

Continuation-in-part of Ser. No. 190,859, Mar. 19, 1980, abandoned. This application Jan. 5, 1982, Ser. No. 337,257

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831768

Int. Cl.³ A63C 9/08

U.S. Cl. 280—612 **10 Claims**



1. A method of automatically releasing a ski boot from a ski on which the ski boot is held by a ski binding, said method comprising the steps of:

generating electrical force signals corresponding to forces exerted by the ski on the leg of the skier;

processing those of said force signals exceeding an integration threshold value, said integration threshold value being a minimum value at which said force signals will be processed to generate monitored signals whose values are a function of the magnitude and duration of said force signals;

comparing said monitored forces with a characteristic release threshold value representing a predetermined function of magnitude and duration, said characteristic release threshold value being a function of said integration threshold value;

releasing the connection between the ski and boot, when the monitored forces exceed the characteristic release threshold value; and

varying said characteristic release threshold value independently of a static actuating force by varying the integration threshold value, said static actuating force being a force which exceeds a minimum magnitude required for releasing the connection between the ski and the boot.

4,457,533

SAFETY BINDING FOR SKI

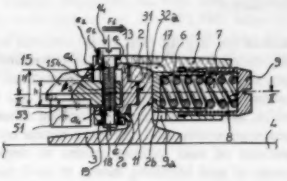
Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon & Fils, Annecy, France

Continuation of Ser. No. 106,148, Dec. 21, 1979, abandoned. This application May 10, 1982, Ser. No. 376,754

Claims priority, application France, Dec. 28, 1978, 78 37119

Int. Cl.³ A63C 9/08

U.S. Cl. 280—628 **26 Claims**



1. A safety binding for use with a ski, said binding comprising:

(a) a holding member adapted to hold one end of a ski boot onto said ski;

(b) a support member adapted to be attached to said ski;

(c) an elastic system; and

(d) an intermediate member; said elastic system acting on said holding member to press said intermediate member against said support member; said holding member and said intermediate member being cooperatively associated to pivot together with respect to said support member with substantially no relative movement between said holding and intermediate members against the bias of said elastic system for release of said boot.

4,457,534

HEELHOLDER FOR SAFETY SKI BINDING

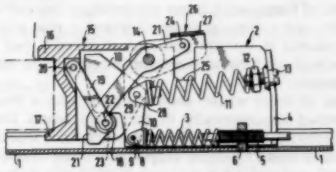
Manfred Richert, Farchant, Fed. Rep. of Germany, assignor to Marker-Patentverwertungsgesellschaft mbH., Baar, Switzerland

Filed Sep. 3, 1981, Ser. No. 299,220

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1980, 3033568

Int. Cl.³ A63G 9/08

U.S. Cl. 280—631 **4 Claims**



1. A heelholder for a safety ski binding, said heelholder comprising:

a baseplate mountable on a ski;

a housing mounted on said baseplate;

a soleholder pivotally mounted on said housing for rotation between closed and open positions, said soleholder being releasably engageable with the sole of a ski boot to secure the boot to the ski;

retaining means movably mounted on said soleholder for releasably retaining said soleholder in the closed position;

locking means movably mounted on said housing for releasably restraining said retaining means to lock said soleholder in the closed position when a ski boot is in said soleholder;

blocking means mounted on said housing and being movable

between a blocking position for releasably blocking said retaining means in a position to be restrained by said locking means, and a releasing position for enabling movement of said retaining means out of the restraint of said locking means;

release means mounted on said locking means for moving said blocking means from said blocking position to said releasing position to release said retaining means in response to removal of a ski boot from the soleholder without the application of a releasing force by the ski boot to the soleholder;

and

biasing means for urging said release means to move said blocking means towards said releasing position in response to removal of a ski boot from the soleholder without the application of a releasing force by the ski boot to the soleholder, and for moving said locking means to release said retaining means, said retaining means moving out of the restraint of said locking means in response to the movement of said blocking means to said releasing position and to the foregoing movement of said locking means, to release said soleholder after said release means moves said blocking means.

4,457,535
WHEELCHAIR

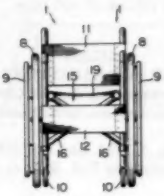
Sakazo Takeuchi; Kikuo Ban; Akira Inoue, and Hiromitsu Otsuka, all of Ibaraki, Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jul. 27, 1983, Ser. No. 517,814

Claims priority, application Japan, Jul. 29, 1982, 57-116027[U]

Int. Cl.³ B62M *1/14*

U.S. Cl. 280—650 **1 Claim**



1. A wheelchair comprising:

a pair of frames each frame comprising a base tubular member, and a front post member and a rear post member mounted in upright positions at forward and rearward ends of said base tubular member respectively and secured thereto;

a pair of drive wheels each equipped with a hand ring attached concentrically to the drive wheel for rotation therewith, and a pair of castors, each drive wheel and each castor being rotatably supported on one of said frames;

a back rest and a leg rest each formed of a web of flexible material connecting said pair of frames together;

at least one pair of yoke members intersecting at intermediate points and connected together for relative pivotal movements at an intersection while being supported at lower ends by said base tubular members for pivotal movement about the axes of the base tubular members;

a pair of seat tubular members each having a length greater than the distance between the front post member and rear post member of each said frame and secured to upper ends of said yokes substantially in parallel to said base tubular members; and

a seat formed of a web of flexible material hung between said pair of seat tubular members;

wherein said seat tubular members are brought into pressing engagement at opposite ends with said front post members and said rear post members of said frames when the pair of frames are spaced apart from each other to bring the back rest and leg rest to a taut condition.

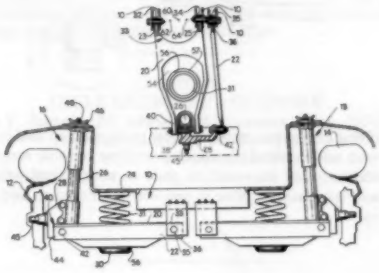
4,457,536
INDEPENDENT REAR WHEEL SUSPENSION WITH ADJUSTABLE TOE ANGLE CONTROL DURING RECESSION

Manfred Rumpel, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 334,332, Dec. 24, 1981, abandoned. This application Sep. 23, 1983, Ser. No. 535,541

Int. Cl.³ B60G *7/02*

U.S. Cl. 280—663 **14 Claims**



1. An independent rear wheel suspension for a vehicle comprising:

a chassis;

a wheel support member;

transversely extending front and rear control arms pivotably connected at their inboard ends to said chassis and at their outboard ends to said wheel support member;

one of said control arms connected to said chassis through two longitudinally spaced resilient bushings.

4,457,537
INDEPENDENT WHEEL SUSPENSION

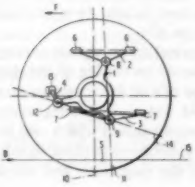
Manfred von der Ohe, Stuttgart, and Helmut Flemming, Hochdorf, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 23, 1981, Ser. No. 333,997

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048837

Int. Cl.³ B60G *3/00*

U.S. Cl. 280—675 **12 Claims**



1. An independent wheel suspension for motor vehicles, the wheel suspension comprising wheel carrier means for supporting a wheel, guide means for supporting the wheel carrier means relative to a body of the vehicle, means provided on the guide means for defining an upper and lower guide point for the wheel carrier with respect to lateral forces, means for mounting at least one of the upper and lower guide points so as to be elastically movable in a transverse direction with respect to the vehicle body, the upper guide point and lower guide point determining a generally vertically extending first pivot axis for the wheel carrier means, and a track rod means extending transversely of the vehicle and adapted to be connected to the wheel carrier means and the body of the vehicle, said track rod offset relative to said first pivot axis, said upper guide point

is mounted so as to be displaced outwardly relative to the lower guide point under an influence of a lateral force on the wheel directed generally transversely of the vehicle and below the lower guide point, the lower guide point and a point of articulation of the track rod means at the wheel carrier means define a second pivot axis for enabling an adjustment of the wheel suspension in a toe-in direction, said second pivot axis, in a side view of the wheel suspension, extends upwardly and obliquely forwardly, relative to the normal driving direction of the vehicle.

4,457,538

FRONT SEAT BELT RETRACTOR DISPOSING STRUCTURE

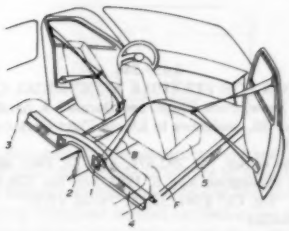
Hiroyuki Watanabe; Yasushi Tanaka, and Ken Miura, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 20, 1982, Ser. No. 370,291

Claims priority, application Japan, Aug. 24, 1981, 56-125075[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—801 **13 Claims**



1. A front seat belt retractor disposing structure comprising: a center floor cross member having at least one opening under a rear seat, through which opening a front seat belt retractor is inserted and is fastened within said floor cross member, said retractor being disposed for a seat belt to be drawn through said opening to the front seat side, and one end of said seat belt being arranged through the center of the front seat.

4,457,539

COMPOSITE LABEL WEB, PRICE TAG AND RE-PRICE LABEL COMBINATION, AND METHOD OF PRICE AND RE-PRICE MARKING

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 236,414, Feb. 20, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 430,086

Int. Cl.³ B32B *3/10*

U.S. Cl. 283—81 **4 Claims**

1. A price tag and re-price label combination, comprising: a price tag having an outer side and an underside, printed price data disposed on the outer side of the price tag, a re-price label having an outer side and an underside, the re-price label having a first label part folded and adhesively adhered at its underside to the underside of an adjoining portion of the re-price label, printed re-price data on the outer side of the first label part, the printed re-price data on the first label part being different from the price data on the price tag, the underside of a remaining portion of the re-price label having a coating of pressure sensitive adhesive, the underside of said remaining portion being adhered to the underside of the price tag at a marginal edge with the first label part projecting beyond the price tag.

4,457,540

MULTICOLOR PRINTED PRODUCT CONTAINING PEARL LUSTER PIGMENT

Dieter Höhne, Vendersheim, Fed. Rep. of Germany, assignor to Druckerei Gorius, Vendersheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 151,915, May 21, 1980, abandoned. This application Dec. 17, 1981, Ser. No. 331,926

Claims priority, application Fed. Rep. of Germany, May 22, 1979, 2920647

Int. Cl.³ G09F *19/12*

U.S. Cl. 283—94 **6 Claims**

1. A multi-color print, comprising a base; a plurality of superimposed different color component images applied to said base and including two adjacent outermost color component images, each of said images having a color distribution in accordance with a mosaic pattern and corresponding to the contribution of the corresponding color component image to the composite image resulting from said plurality of color component images, said composite image having lighter and darker areas; and an additional component which is at least partially transparent and includes white pearl luster pigment, said additional component being applied over one of said outermost color component images and its pigment being distributed in accordance with a mosaic pattern and in such a way that more pigment is present in the lighter than in the darker areas of said composite image.

4,457,541

PIPE COUPLING

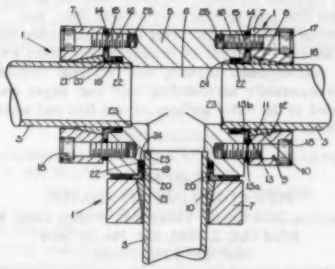
John J. Kelly, Finham, and Jeremy R. Hughes, Wellesbourne, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Oct. 7, 1981, Ser. No. 309,439

Claims priority, application United Kingdom, Oct. 16, 1980, 8033460

Int. Cl.³ F16L *55/00, 21/06*

U.S. Cl. 285—23 **10 Claims**



1. A pipe coupling comprising an annular flange member having a tapered inner surface portion and a plurality of holes therethrough, bolts projecting through said holes; means for

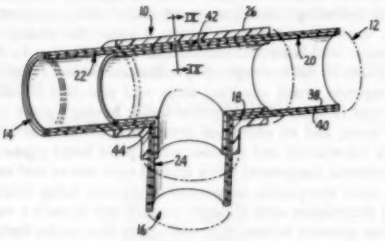
retaining said bolts agsinst disengagement from said holes; a pipe-engageable collet mounted in said flange member and having a tapered outer surface portion engaged with said tapered inner surface portion; an annular seal back-up member positioned to retain said collet against disengagement from said flange member; and means for retaining said seal back-up member against detachment from said flange member; and wherein both of said retaining means are defined by an annular retainer element which overlaps an outer peripheral portion of said seal back-up member, the retainer element having a plurality of holes therethrough which are in substantial alignment with said holes through said flange member, and said bolts projecting through said holes in said retainer element, whereby said bolts and said retainer element are retained in position by virtue of their mutual interengagement and said seal back-up member and said collet are retained in position by virtue of the engagement of said retainer element with said seal back-up member.

4,457,542

PLASTIC PIPE FITTING

Robert R. Shaefer, and Kenneth J. Matthews, both of Louisville, Ky., assignors to Nibco Inc., Elkhart, Ind.

Filed Sep. 21, 1981, Ser. No. 303,757
Int. Cl.³ F16L *47/00*
U.S. Cl. 285—55 **11 Claims**



1. A pipe fitting comprising:

a liner of thermoplastic material which defines a fluid passage therethrough,

first and second short pipe sections, each comprising an inner thermoplastic lining and a fiber-reinforced outer layer, said outer layer being comprised of a plurality of reinforcement fibers embedded in and encompassed by a thermosetting resin, said fibers being individually and continuously wound around said pipe sections,

said first pipe section being bonded to an outer surface of a first section of said liner such that an end edge of said first pipe section overlies said liner,

said second pipe section being bonded to an outer surface of a second section of said liner such that an end edge of said first pipe section overlies said liner, and

an external reinforcement layer of thermosetting resin having an external layer of reinforcement fibers embedded and encompassed therein, said external reinforcement layer externally surrounding said end edges and being bonded to the outer surfaces of said first and second pipe sections.

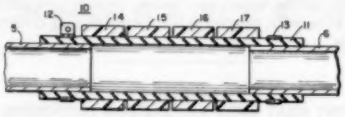
4,457,543

PIPE COUPLING APPARATUS

Lowell Justus, 2634 Center Valley Rd., Willits, Calif. 95490

Filed Oct. 2, 1981, Ser. No. 307,654
Int. Cl.³ F16L *21/00*
U.S. Cl. 285—236 **6 Claims**

1. A pipe coupling comprising flexible hose means fitted over opposing, ends of two pipe sections to be joined but separated from each other by at least several inches, a pair of clamping means mounted on opposite ends of said hose means to clamp said hose means onto said pipe ends, and a plurality of rigid, cylindrical sleeves mounted in side-by-side relation over said hose means to span substantially the entire distance between said pair of clamping means and thereby to provide a confinement channel for the section of said flexible hose spanning said ends of said pipe sections, the total cumulative length



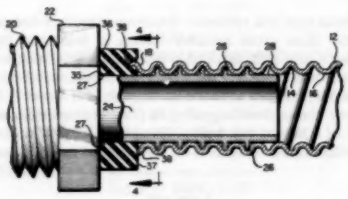
of said sleeves being only slightly less than the distance between said pair of clamping means and the inner diameter of each of said sleeves being only slightly greater than the outer diameter of said flexible hose, each of said clamping means including at least one structural portion projecting radially outward a distance sufficient to mechanically confine said sleeves therebetween.

4,457,544

CONNECTOR FOR FLEXIBLE ELECTRICAL CONDUIT

Thomas M. Snow, Park Ridge, and Bernard J. Muslin, Evanston, both of Ill., assignors to Liquid Tight Corporation, Bensenville, Ill.

Continuation of Ser. No. 292,571, Aug. 13, 1981, abandoned.
This application Aug. 5, 1983, Ser. No. 520,220
Int. Cl.³ F16L *33/00, 19/00, 15/00*
U.S. Cl. 285—251 **11 Claims**



1. A connector for an air and liquid tight, electrical conduit formed of a plurality of interlocked sections and having an interior wall of arcuately formed members, said connector comprising:

an elongated hollow body having an annular ridge projecting from the outer surface of said body and intermediate a threadable mating body end and a ferrule end for insertion into said conduit;

a plurality of spatially separted arcuate segments formed on the exterior surface of said ferrule and corresponding to said conduit arcuately formed members so as to enable threadable engagement of said ferrule with one end of said conduit;

an annular seat member with an inner seat surface and an outer seat surface and mounted on said ferrule with said inner seat surface in abutting engagement against said annular ridge; and

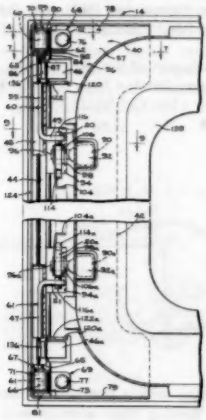
said annular seat member formed of resilient material to enable the entire perimeter of said conduit end to depressingly engage and penetrate said outer seat surface to sealingly terminate said conduit end within said annular seat member upon threadable engagement of said ferrule with said conduit and thereby provide a smoke tight, water tight and dust tight seal and termination for said conduit.

4,457,545

DOOR LATCH ASSEMBLY

Arthur C. Wilson, and Ray C. Eigelbach, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed May 3, 1982, Ser. No. 374,361
Int. Cl.³ E05C *9/04*
U.S. Cl. 292—29 **9 Claims**



1. In a latch assembly for securing a microwave oven door having an inner liner to the front face of a microwave oven, said latch assembly including two spaced latch pawls pivotally secured to an elongated support member in the door and projecting through the inner liner of the door and movable to latching and unlatching positions, said pawls being biased to the latching position, and a vertical handle on the outside of the door secured to a transverse vertical actuator member such that upon pulling the handle, the actuator member rotates and pivots the pawls in unison to the unlatching position, the improvement comprising:

the actuator member having secured at each end thereof pivot rods extending longitudinally beyond the actuator member,

bushings secured to the support member at each end to retain the respective pivot rods, and

means to bias the actuator member longitudinally in one direction.

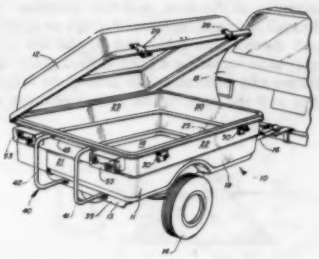
4,457,546

BUMPER ASSEMBLY FOR TRAILER

Morris N. Wiant, Wichita, and Frank T. Schmidt, Mulvane, both of Kans., assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Jun. 28, 1982, Ser. No. 392,810
Int. Cl.³ B60R *19/02*
U.S. Cl. 293—102 **8 Claims**

1. In a trailer including a body having a side wall and a shaped upper rim along the upper edge portion of the side wall and reinforcing means attached to the upper rim, a bumper assembly including a pair of spaced-apart bumpers extending outwardly from the side wall, each of the bumpers having an upper end connected to a connecting plate extending between



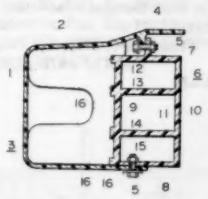
the bumpers, the connecting plate engaging the reinforcing means.

4,457,547

BUMPER REINFORCEMENT STRUCTURE FOR VEHICLES

Kenichi Sekiyama; Yasuhiro Mishima; Hisao Hiraiwa, all of Toyota, and Joichiro Segawa, Chigasaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi and Asahi Glass Company, Ltd., Tokyo, both of, Japan

Filed Apr. 2, 1982, Ser. No. 365,045
Claims priority, application Japan, Nov. 6, 1981, 56-177250
Int. Cl.³ B60R *19/00*
U.S. Cl. 293—110 **8 Claims**



1. A bumper reinforcement structure for vehicles comprising: a fiberglass reinforced plastics (FRP) bumper reinforcement laterally mounted to the vehicle, the bumper reinforcement being rectangular in cross section and having a bracket for mounting the elastic bumper to the front thereof; at least one horizontally extending reinforcement web provided between the top and bottom plates of the bumper reinforcement to connect the front and rear walls of the bumper reinforcement; and forwardly projecting strips formed at the intersections between the front wall and the top and bottom plates as well as the reinforcement webs.

4,457,548

ASH AND DEBRIS SCOOP

Ivan L. Robins, Box 124, Scipio, Utah 84656, and Lavoy Starley, 290 N. 300 W., Fillmore, Utah 84631

Filed Apr. 16, 1982, Ser. No. 369,268
Int. Cl.³ A47F *13/08*
U.S. Cl. 294—55 **7 Claims**

1. An ash and debris scoop comprising

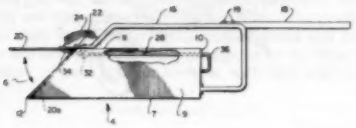
a receptacle having a generally flat bottom wall, side walls, a rear wall and top wall, said receptacle being open at one end,

a door hingedly attached to the forward edge of the top wall for pivoting between a closed position, in which the door covers the opening in the receptacle, and an open position,

in which the door is pivoted upwardly and away from the opening,

means biasing the door normally to the open position,

an elongate pull rod, one end of which is attached to the underside of the door, said rod extending from the door through the receptacle and through an opening in the rear wall thereof, the other end of the rod exterior to the receptacle including a hook-shaped grasping element for grasping by hand to enable pulling the rod rearwardly to thus pull the door to the closed position, said pull rod



being formed with at least one notch therein to engage the lip of the opening in the rear wall when the rod is pulled rearwardly so that the door is in the closed position, to thereby prevent the rod from moving forwardly, and

a handle which extends from a point generally near the forward edge of the top wall upwardly, rearwardly, and downwardly to a point on the rear wall below the grasping element, a rear portion of the handle being spaced behind the grasping element a distance to enable grasping and pulling the grasping element with one hand while holding the rear portion of the handle with said one hand.

4,457,549

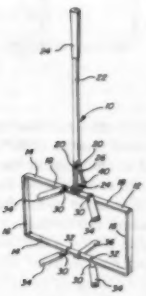
BAG MOUTH HOLDER

John Lowery, 1008 Douglas MacArthur Rd., NW., Albuquerque, N. Mex. 87107

Filed Feb. 7, 1983, Ser. No. 464,520

Int. Cl.³ A47F *13/08*

U.S. Cl. 294—55 **10 Claims**



1. A holder for the mouth of a bag, said holder including a peripherally continuous frame adapted to receive the open mouth of a bag therethrough with the free portions of said mouth folded outwardly and back over the outer surfaces of said frame, peripherally spaced portions of said frame each having one end of an elongated arm member pivotally anchored thereto for oscillation about an axis transverse to said arm member and the corresponding frame portion, the free end portion of each arm member including an elongated longitudinally extending clamp portion spaced along the arm member from the corresponding axis and which is generally U-shaped in transverse cross section, opens laterally outwardly of the arm member in a direction transverse to the pivot axis thereof and includes open ends, said clamp portions being swingable into and out of positions with an adjacent frame portion embracingly received therein and extending longitudinally therealong, whereby when the free edge portion of a bag is folded outwardly and back over said adjacent frame portion the last mentioned free edge portion may be releasably clamped to said adjacent frame portion.

4,457,550

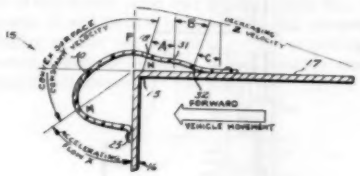
MEANS FOR REDUCING VEHICLE DRAG

Robert L. Gielow, Farmington Hills, and James C. Paul, Ann Arbor, both of Mich., assignors to Fruehauf Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 138,136, Jul. 7, 1980, abandoned. This application Mar. 2, 1982, Ser. No. 354,125

Int. Cl.³ B62D *35/00*

U.S. Cl. 296—1 S **14 Claims**



1. In combination with a first surface having a transverse orientation to a flowing fluid wherein said first surface terminatingly joins a second flanking surface extending downstream of said first surface, apparatus to encourage attainment of attached fluid flow over said second flanking surface comprising a transversly elongate element having a stream-wise cross section trace projecting upstream from said first surface, curvingly reversing direction downstream and tangently joining said second surface, said cross section trace simulating the leading edge portion of an airfoil shape.

4,457,551

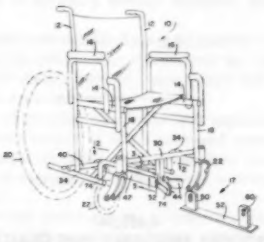
VEHICLE SPEED-LOCK WHEELCHAIR RESTRAINT SYSTEM

James W. Anthony, Somers, Conn., assignor to Target Industries, Inc., Wharehouse Point, Conn.

Filed Dec. 14, 1981, Ser. No. 330,533

Int. Cl.³ B60N *1/02*; B60P *3/06, 7/08*

U.S. Cl. 296—65 R **4 Claims**



1. Improved speed lock restraint system for wheelchair systems comprising

a wheelchair frame assembly supporting a seat and wheels and including at least four vertical bar members and having plural horizontal members defining said frame assembly,

an inverted U-shaped main channel horizontally disposed and extending between a pair of said horizontal members of said wheelchair frame assembly,

an anchor means secured to a floor plate having at least one upstanding extension with an aperture therein, and

a pivot arm centrally pivotable from said U-shaped main channel having end projections for engaging an aperture of said U-shaped main channel and said aperture of said upstanding extension when aligned.

4,457,552

FRONT COWLING FOR MOTORCYCLES WITH DEFLECTORS FOR HEATED AIR

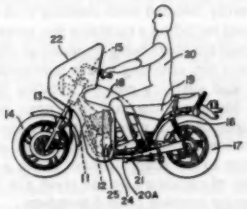
Tatsuzo Katsuoka, Hamamatsu, Japan, assignor to Yamaha Hatausoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 29, 1982, Ser. No. 393,446

Claims priority, application Japan, Jul. 6, 1981, 56-104491

Int. Cl.³ B62J *17/06*

U.S. Cl. 296—78.1 **1 Claim**



1. A front cowling for a motorcycle, said motorcycle including a frame having a forward direction, a seat for a rider so disposed and arranged that the rider's legs straddle the frame, with the lower portions of the legs below the knees disposed rearwardly of at least part of the engine, said cowling having side portions which extend rearwardly alongside at least a portion of said engine, and which cowling has an aperture ahead of the engine whereby air that enters the cowling is heated by the engine, a side port in each side of said cowling forwardly from said lower leg portion, and rearwardly from at least a portion of said engine and a baffle pivotally mounted to said cowling adjacent to each said port adapted to be moved to close said port whereby to cause heated air to impinge on said lower portions of said legs, or to open said ports whereby to deflect said heated air away from said lower portions of said legs and out said ports.

4,457,553

PORTABLE SHOWER FOR VAN OR CAMPER VEHICLE

William G. Larkin, 1243 Castlemont, San Jose, Calif. 95128

Filed Dec. 6, 1982, Ser. No. 447,456

Int. Cl.³ B60P *3/34*

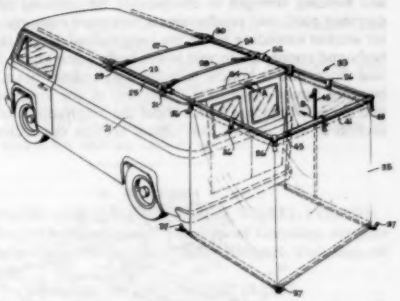
U.S. Cl. 296—160 **5 Claims**

1. A shower enclosure for a van or the like of the type having rain gutters about the roof periphery comprising,

a pair of spaced apart, parallel tubes mounted near opposite lengthwise rain gutters of a van roof, said tubes supporting, in telescopic relation, a lightweight, U-shaped frame which, when telescoped outwardly, is supported in cantilever manner,

a shower curtain of tent-like material having dimensions adapted to hang on said U-shaped frame and closing a space extending downwardly from said U-shaped frame at least several feet and extending laterally around said U-shaped frame, and

bracket means for mounting said parallel tubes with respect to opposite lengthwise rain gutters of the van roof, said bracket means comprising a plurality of brackets having a lower C-shaped region disposed about the outside rim of said rain gutters and an upper C-shaped region connected to the lower C-shaped region but facing in the opposite direction, the upper C-shaped region disposed about a tube, and a pair of adjustable tensioning straps laterally spanning said roof having ends connected to opposite



tubes, said straps tensioned to hold the tubes in the brackets and the brackets in the rain gutters.

4,457,554

METHOD FOR DISPATCHING AIR PASSENGERS, AIRPORT INSTALLATION SUITABLE AND VEHICLE SUITABLE THEREFOR

Georg Fuisz, Scharnhorststr. 16, D-3057 Neustadt, and Lyubomir Szabo, Ostlandstr. 42, D-5000 Köln, both of Fed. Rep. of Germany

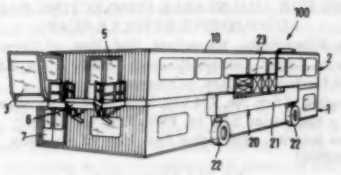
PCT No. PCT/DE81/00067, § 371 Date Dec. 23, 1981, § 102(e) Date Dec. 23, 1981, PCT Pub. No. WO81/03004, PCT Pub. Date Oct. 29, 1981

PCT Filed Apr. 27, 1981, Ser. No. 336,389

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3016024; Aug. 28, 1980, 3032342; Feb. 5, 1981, 3103916

Int. Cl.³ B62D *31/02*

U.S. Cl. 296—179 **27 Claims**



1. A method for dispatching air passengers between the arrival in an arrival zone and the boarding of the airplane, including check-in, baggage checking and transportation from the arrival zone to an aircraft standing at a ramp, comprising:

(a) conducting the air passengers, after arrival at an arrival zone, into a vehicle together with their baggage;

(b) carrying out check-in, and baggage checking in said vehicle; and

(c) transporting the air passengers directly to the aircraft in said vehicle.

4,457,555

CONVERSION OF VEHICLE BODIES

David L. Draper, Hamburg, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.

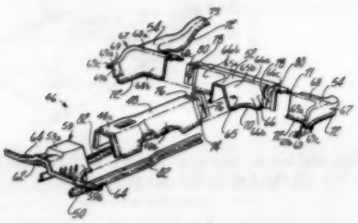
Filed Jul. 10, 1981, Ser. No. 282,078

Int. Cl.³ B62D *21/02*

U.S. Cl. 296—186 **21 Claims**

1. A vehicle body in which the load carrying roof has been removed and which has a lower body assembly comprising a

floor pan with forward and rear suspension supporting sub frames respectively projecting forwardly and rearwardly therefrom, the improvement comprising a reinforcement structure secured to said lower body assembly for adding torsional and bending strength to compensate for removal of the load carrying roof, said reinforcement structure comprising: a center section extending along the longitudinal axis of the vehicle body and connected to said lower body assembly to form with said floor pan a hollow tubular longitudinal beam to resist bending forces about axes transverse to the longitudinal axis and to resist torsional forces about the longitudinal axis; a front section at one end of said center section connected to said



lower body assembly to transmit torsional and bending forces from said forward sub frame to said center section; a rear section at the other end of said center section connected to said lower body assembly to form with said floor pan a transverse beam for transmitting torsional and bending forces from said rear sub frame to said center section; said rear section including a pair of rear extension members having leading and trailing segments projecting forwardly and rearwardly, respectively, from said transverse beam in a spaced relationship from each other on opposite sides of the longitudinal axis; and said extension members being connected with said lower body assembly to transmit bending and torsional forces from said rear sub frame to said transverse beam.

4,457,556

FITTING FOR ADJUSTABLY CONNECTING PARTS OF AUTOMOTIVE VEHICLE SEATS

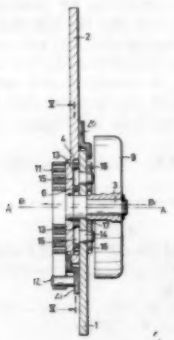
Margret Klingelhöfer, Remscheid, Fed. Rep. of Germany, assignor to Keiper Automobiltechnik GmbH & Co. KG, Remschied-Hasten, Fed. Rep. of Germany

Continuation of Ser. No. 774,938, Mar. 7, 1977, abandoned. This application Sep. 16, 1980, Ser. No. 187,972

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1976, 2609607

Int. Cl.³ A47C *1/025*

U.S. Cl. 297—362 **2 Claims**



1. A fitting for adjustably connecting a backrest part to a seat part of a seat, particularly a seat of an automotive vehicle, comprising: a backrest mounting member connectable to the part; a ring gear having an axis and being arranged on one of said members, said ring gear having a predetermined number of inwardly directed teeth centered relative to the ring gear axis; a spur gear having a further axis and being arranged intermediate the one and the other of said members, the spur gear having a number of outwardly directed teeth, which is at least one less than the predetermined number of teeth on the ring gear, said outwardly directed teeth of said spur gear being in meshing engagement with said inwardly directed teeth and being centered relative to the further axis; eccentric means for radially offsetting said further axis from said ring gear axis and including auxiliary pins mounted circumferentially about the pivot axis, each of the pins extending through one of said members and having one end, a cam mounted to the one end of the associated pin and being in motion-transmitting engagement with said spur gear; turning means for displacing said spur gear for orbiting said further axis about said ring gear axis with said outwardly directed teeth meshing with said inwardly directed teeth and including a rotatable pin, extending through said members, said members being mounted at spaced locations lengthwise of said pin; coupling means intermediate said turning means and said auxiliary pins for rotating the latter with said cams and for displacing said spur gear; and means for mounting said members for movement about the pivot axis so that upon operation of the turning means said one member is displaced relative to the other member along a circular path having its center of curvature on the pivot axis for providing the relative angular position of said members.

4,457,557

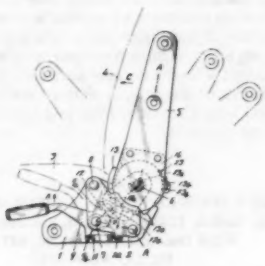
RECLINING DEVICE FOR USE IN A VEHICLE

Toshiaki Une, 25-7, 6-chome Unuma Yamazaki-cho, Kagamigahara-shi, Gifu, Japan

Filed Dec. 30, 1981, Ser. No. 335,675

Int. Cl.³ B60N *1/02*

U.S. Cl. 297—362 **3 Claims**



1. A hinge fitting for adjustably positioning the seat back of a vehicle seat comprising,

a stationary bracket adapted to be mounted on the lower seat element of a vehicle seat,

a movable bracket adapted to be mounted on the seat back, an eccentric shaft having an eccentric portion disposed between two coaxial end portions, one end of said shaft being rotatably mounted in said movable bracket,

a shaft supporting bracket mounted on said movable bracket and rotatably supporting the other end of said shaft,

a hole in said stationary bracket rotatably receiving said eccentric portion of said shaft,

an intermediate bracket rotatably mounted on said eccentric portion of said shaft between said stationary bracket, and said movable bracket,

a differential reduction gearing mechanism operably engaging said intermediate bracket with said movable bracket comprising external gear teeth on said intermediate bracket and internal gear teeth on said movable bracket

meshing with said external gear teeth and having the same pitch but a larger diameter and slightly greater number of teeth,

handle means connected to said eccentric shaft at said one end thereof to rotate said shaft and eccentric portion to thereby operate said gear mechanism to adjust the inclination of said seat back,

a support plate mounted on said stationary bracket and extending over said other end of said eccentric shaft,

a stub shaft fixedly mounted in said support plate substantially coaxially and colinearly with respect to said eccentric shaft,

a spiral spring mounted on and operatively connected at one end to said stub shaft and at the other end to said intermediate bracket for resiliently urging said movable bracket through said gearing mechanism toward the upright forward position of said seat back,

a hand operating lever pivotally mounted on said stationary bracket,

an adjusting lever pivotally mounted on said stationary bracket above said operating lever and extending between said operating lever and said intermediate bracket,

external gear teeth on said intermediate bracket,

gear teeth on said adjusting lever engageable with said external gear teeth on said intermediate bracket,

a cam slot in said operating lever,

a pin extending from said adjusting lever operatively engaging in said cam slot so that movement of said operating lever about its pivotal axis will move said adjusting lever to engage or disengage the gear teeth thereof with said external gear teeth on said intermediate bracket, and

spring means operatively connected between said operating lever and said stationary bracket to urge said operating lever and thereby said adjusting lever into the engaged position with said intermediate bracket, so that when said adjusting lever is in the disengaged position, the seat back may be adjusted to inclined positions.

4,457,558

UP AND DOWN MOVING MECHANISM FOR AN AIR SPOILER ASSOCIATED WITH A MOVABLE GRILL

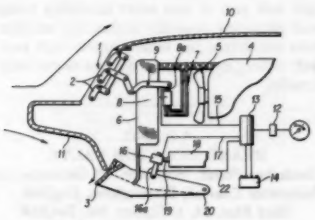
Masanobu Ishikawa, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 21, 1982, Ser. No. 370,336

Claims priority, application Japan, Apr. 22, 1981, 56-58342[U]

Int. Cl.³ B62D *35/00*

U.S. Cl. 296—1 S **6 Claims**



1. In a motor vehicle including a front bumper, a movable air spoiler positioned below said bumper, a movable grill and an engine including a radiator positioned behind said grill, an apparatus for moving said air spoiler between a first position in which a gap is formed between said air spoiler and said bumper and a second position in which said gap is closed, said apparatus comprising:

first detecting means for detecting the road speed of said vehicle;

a thermostat including movable output means connected to said grill for opening and closing said grill, said thermostat being actuated in response to the temperature of the water in said radiator;

means for moving said air spoiler between said first and second postions;

second detecting means for detecting the position of said thermostat output means;

third detecting means for detecting the position of said means for moving said air spoiler; and

control circuit means receiving signals from said first, second and third detecting means and supplying signals to said means for moving said air spoiler.

4,457,559

FASTENING ARRANGEMENT FOR WHEEL COVERS

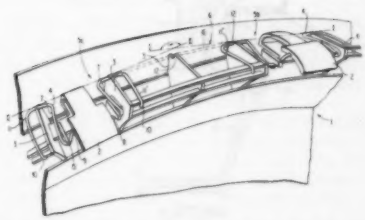
Udo D. Renz, Rechberghausen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 19, 1981, Ser. No. 312,897

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1980, 3039219

Int. Cl.³ B60B *7/06*

U.S. Cl. 301—37 P **11 Claims**



1. A wheel cover fastening arrangement for motor vehicles, comprising clip means for supporting said cover, and spring elements of a basic U-shape, the legs of each spring element of U-shape extending generally axially with respect to the wheel cover and the legs of a respective spring element being connected with each other at their ends away from the wheel cover, by way of a crosspiece extending in the circumferential direction, said crosspiece being curved radially toward the outside and being supported in a radially springy manner by said legs which pass over at their ends that are away from said crosspiece, into supporting sections, said supporting sections secured extending in the circumferential direction and toward opposite sides and having a holding effect in the axial as well as radial direction, characterized in that radially outer abutments are coordinated to the spring elements in the area of the crosspieces and radially inner abutments on the cover are coordinated to the spring elements in the area of the supporting sections, that supporting arms adjoining the supporting sections and extending at an angle to said supporting sections are provided, said supporting arms being supported in the area of their ends on the cover opposite the spring forces, and that the crosspiece of each spring element is so arranged as to abut at an underface of a respective clip means.

4,457,560

HUBCAP WITH IMPROVED RETENTION STRUCTURE

Robert L. Rowe, 5072 Timberview Ct., Saline, Mich. 48176, and Kenneth W. Christensen, Southfield, Mich., assignors to General Motors Corporation, Detroit, Mich. and Robert L. Rowe

Filed Jan. 7, 1982, Ser. No. 337,782

Int. Cl.³ B06B *7/06*

U.S. Cl. 301—37 P **7 Claims**

1. In combination with a wheel including a rim and a spider, and a hub on which the wheel is mounted by a plurality of wheel fasteners securing the wheel spider to the hub for rota-

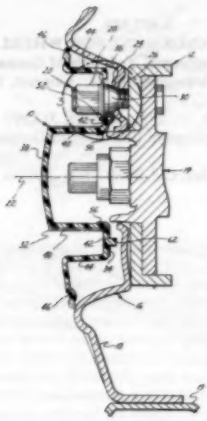
tion as a unit about an axis, a hub cap for the wheel spider comprising, in combination,

an outer hub cap element and an inner retention element,

said hub cap element having an axially facing wall juxtaposed to the spider and including a plurality of apertures, each respective to one of the wheel fasteners, so as to allow said wheel fasteners to extend axially outwardly through said apertures,

said retention element including an axially facing annular body portion seated against said wall of said hub cap element,

cooperating means on said wall and said annular body portion securing said retention element to said hub cap element,



said annular body portion including a plurality of integral retention tabs, each tab being respective to one of said apertures,

each tab extending axially outwardly of said body portion and axially through a respective one of said apertures adjacent an edge portion thereof and facing radially of such aperture, said retention tabs having a radially outward free position interference fit with said fasteners and being deflected radially inwardly by said fasteners to exert a radially outward retaining force on such fasteners for retaining the hub cap on the wheel.

4,457,561

COVERS FOR THE WHEELS OF MOTOR CARS

Herbert F. Whitmarsh, High Barnet, England, assignor to Initial Plastics Ltd., High Barnet, England

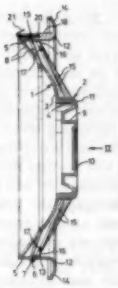
Continuation of Ser. No. 232,149, Feb. 6, 1981, abandoned. This application Jun. 23, 1983, Ser. No. 507,209

Claims priority, application United Kingdom, Mar. 31, 1980, 8010790

Int. Cl.³ B60B *7/04*

U.S. Cl. 301—37 SS **11 Claims**

1. A wheel cover of moulded material for fitting within the rim of an automobile wheel to simulate a wire spoked wheel, said wheel cover comprising an inner one-piece moulding and an outer one-piece moulding interfitting coaxially for insertion within said wheel rim, each one-piece moulding comprising a radially outer rim part, a central hub part, and an associated series of simulated wire spokes, each spoke having radially outer and inner ends joined respectively with the associated rim part and hub part as unitary moulded portions thereof, the series of spokes associated with said inner moulding comprising an inner series spaced axially inwardly from the series of spokes associated with said outer moulding and comprising an outer series, the spokes of both series being arranged in circumferentially spaced crossing pairs moulded together at the region of crossing, the ends of the spokes in each crossing pair joined with one of said parts of said inner moulding lying in a first inner plane perpendicular to the principal axis of said cover, the spokes in each last named crossing pair extending from said first inner plane and diverging axially from each other to ends joined with the other of said parts of said inner moulding in paired axially spaced inner planes parallel to and spaced axially from said first inner plane, the end of one spoke in each crossing pair joined with said other of the inner moulding parts lying in one of said paired axially spaced inner planes, and the end of the other spoke in each crossing pair joined with said other of the inner moulding parts lying in the other of said paired axially spaced inner planes, the ends of the spokes in each crossing pair joined with one of the parts of said outer moulding lying in a first outer plane parallel to said first inner plane, the spokes in each last named crossing pair extending from said first outer plane and diverging from each other to



ends joined with the other of said parts of said outer moulding at paired axially spaced outer planes parallel to and spaced axially from said first outer plane, the end of one spoke in each crossing pair joined with said other of the outer moulding parts lying in one of said paired axially spaced outer planes, and the end of the other spoked in each crossing pair joined with said other of the outer moulding parts lying in the other of said paired axially spaced outer planes, said rim parts of said inner and outer mouldings interfitting coaxially, the spokes associated with said rim parts having radially outer ends joined with said rim parts at a common cylindrical surface, the hub part of said outer moulding comprising a coaxial annular hub part having the radially inner ends of the associated spokes joined thereto, said hub part of said inner moulding comprising an annular wall extending coaxially within said annular hub part of said outer moulding, the latter annular hub part and said annular wall closely engaging each other in mutually supporting relationship.

4,457,562

BRAKE ISOLATOR VALVE

Josef Pickenhahn, Plaidt, Fed. Rep. of Germany, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 31, 1982, Ser. No. 364,024

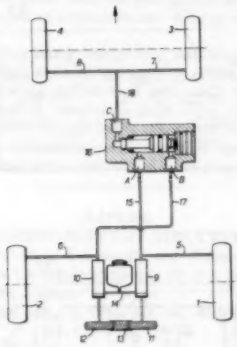
Claims priority, application United Kingdom, Apr. 7, 1981, 8110833

Int. Cl.³ B60T *11/20*

U.S. Cl. 303—6 A **5 Claims**

1. A hydraulic brake system for a vehicle which includes a pair of front ground-engaging members and a pair of rear ground-engaging members and which is steerable by selectively braking one of the rear ground-engaging members, the system comprising: a separate hydraulic rear brake mechanism for each rear ground-engaging member; first and second hydraulic master cylinders each connected to a respective one of said hydraulic brake mechanisms, each master cylinder being separately operable to brake its associated rear ground-engag-

ing member; a separate hydraulic front brake mechanism for each front ground-engaging member; and a control valve connected to both hydraulic master cylinder outputs and to both front brake mechanisms, the control valve including: a closed chamber connected to the output of the second master cylinder; a flow chamber connected to the output of the first master cylinder and to the front brake mechanisms; a control



piston separating said chambers; a normally open valve set located in said flow chamber and closable to isolate the output of the first master cylinder from the front brake mechanisms; and means coupling said valve set to said control piston whereby movement of said control piston in response to the pressure in said flow chamber exceeding the pressure in said closed chamber by a predetermined amount closes said valve set.

4,457,563

ANTI-SKID HYDRAULIC BRAKING SYSTEMS FOR VEHICLES

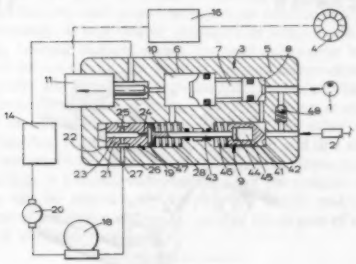
Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Oct. 7, 1982, Ser. No. 433,232

Claims priority, application United Kingdom, Oct. 13, 1981, 8130883

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—92 **8 Claims**



1. An anti-skid hydraulic braking system for vehicles comprising a wheel brake, a source of hydraulic fluid under pressure for applying said brake, skid sensing means for emitting skid signals responsive to behaviour of said wheel when said brake is applied, a modulator assembly for modulating the supply of fluid from said source to said brake in response to said skid signals from said skid sensing means, said modulator assembly comprising a housing having a bore, a de-boost piston working in said bore, a first valve, means in said housing defining an expander chamber between an end of said de-boost piston and said first valve, said first valve being disposed between said source and said expander chamber, means in said housing defining a support chamber to which said de-boost piston is subjected, and a second valve for controlling application to said de-boost piston of support fluid in said support chamber to determine the relative position of said de-boost piston in said bore, said support fluid normally being adapted to provide a biassing force for holding said de-boost piston in an advanced position in which the effective volume of said expander piston is at a minimum value, and said first valve being movable between an open position at least when said de-boost piston is in said advanced position and a closed position when said de-boost piston is displaced from said advanced position and into a retracted position, and means responsive to a skid signal to manipulate said second valve in order to release said support fluid thereby reducing said biassing force whereafter said piston can move away from said advanced position and into said retracted position in which said effective volume of said expander chamber is increased thereby reducing said pressure of fluid applied to said brake, wherein pressure-responsive means for controlling operation of said first valve are adapted to open said first valve upon failure of said support fluid and irrespective of the position of said de-boost piston.

4,457,564

TENSIONING DEVICE FOR ENDLESS CHAIN

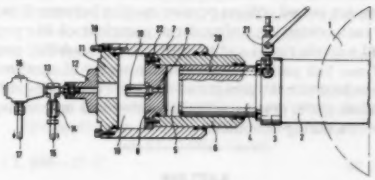
Hans Ruge, Wardenburg, and Gerold Wöbken, Elsfleth, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Klaus-Gerd Hoes GmbH & Co., KG, Wardenburg, Fed. Rep. of Germany

Filed Jan. 28, 1982, Ser. No. 343,543

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104323

Int. Cl.³ B62D *55/00*

U.S. Cl. 305—10 **2 Claims**



1. A tensioning device for an endless chain having a guide element, comprising:

a working cylinder having a cylinder chamber;

a holding cylinder formed as a holding piston guided in said working cylinder;

a tensioning piston displaceably guided in said holding cylinder for pressing against said guide element;

inlet means for connecting said chamber of said working cylinder to a pressure regulated hydraulic source, said inlet means including a nonreturn valve;

outlet means in said working cylinder including a pressure relief valve; and

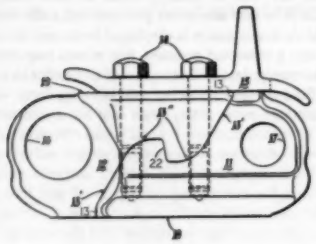
means hydraulically communicating between said cylinder chamber of said working cylinder and said holding cylinder.

4,457,565

TWO-PIECE MASTER TRACK LINK

Maurizio Bissi, No. 4 Via Cammello, Ferrara, and Andrea Cocco, No. 10 Via Monte Piana, Castelfranco Venetao (Prov. of Treviso), both of Italy

Continuation-in-part of Ser. No. 213,547, Dec. 5, 1980, abandoned. This application Jul. 23, 1982, Ser. No. 401,324
Claims priority, application Italy, Dec. 5, 1979, 51000 A/79
Int. Cl.³ B62D 55/20
U.S. Cl. 305—58 R 3 Claims



1. In a master track link having an outer surface for receiving a track shoe, comprising a first link part and a second link part, said first link part being formed with a bore to receive a pin bushing and said second link part being formed with a bore to receive a pin, said first and said second link part each having a contacting surface and matingly juxtapositioned each other along said contacting surface, said first link part having a pair of through holes and said second link part having a pair of threaded blind holes; and a pair of screws passing through the respective through holes and screwed into the respective blind holes of the link parts to connect said shoe to the track link and to secure said link parts to each other, each of said contacting surfaces including two substantially vertical end portions, two oblique portions extending in two imaginary parallel planes, said end portions merging into the respective oblique portions, two substantially horizontal portions extending in two imaginary parallel planes, said oblique portions merging into the respective horizontal portions, and a central portion extending between said horizontal portion and inclined with respect to an imaginary vertical plane, an improvement consisting in that said central portion is inclined at the angle of friction of about 10° to said imaginary vertical plane and is sized to have a ratio with respect to said oblique portion ranging between 1 to 3–4, so that each contacting surface forms a single hook-like projection and a single recess and in assembly the hook-like projection of one link part is received in the recess of another link part so as to assure the contact on the entire contacting surface of said link parts, thus avoiding loosening and unscrewing of said screws during operation.

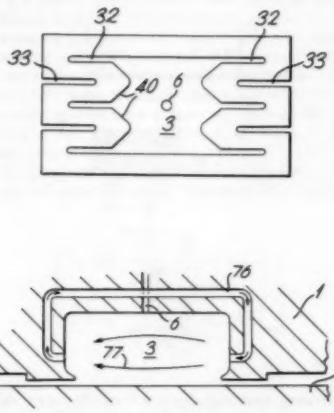
4,457,566

BEARINGS

Mohammed E. Mohsin, Manchester, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 39,440, May 15, 1979, Pat. No. 4,307,918. This application Jun. 17, 1981, Ser. No. 274,385
Claims priority, application United Kingdom, May 17, 1978, 20298/78
Int. Cl.³ F16C 32/06
U.S. Cl. 308—5 R 4 Claims

1. A hydrostatic bearing comprising:
first and second relatively moveable bearing members;
first and second confronting surfaces presented by said first and second bearing member, respectively;
a recess formed in said first member and supplied in use with fluid under hydrostatic pressure, whereby, in use, said surface are separated by a film issuing from said recess;
said recess having a mouth defining an opening in said first confronting surface, and
guide means co-operating with said recess and lying wholly separated from said first confronting surface so that said guide means is disposed within said recess and on a side of said first confronting surface that is remote from said



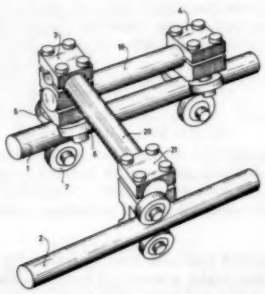
second confronting surface, whereby circulatory movement of said fluid within said recess due to friction from said second confronting surface is conducted in a manner which avoids substantial direct contact between adjacent streams of said fluid moving in opposite directions within said recess.

4,457,567

BUILDING SYSTEM INCLUDING A CONSTRUCTION MEMBER WHICH IS MOVABLE ON TWO GUIDES

Arie W. Kraan, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 69,401, Aug. 24, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 194,176
Claims priority, application Netherlands, Aug. 29, 1978, 7808872
Int. Cl.³ F16C 29/04
U.S. Cl. 308—6 R 6 Claims



1. A building system including two guides and a slide-like construction member which is movable on the guides, characterized in that the guides are formed by two rods or tubes having a circular cross-section and the slide-like construction member comprises:
two bearing blocks, each of which comprising three shafts,

each shaft having an axis, and three ball bearings of the same diameter, one ball bearing mounted on each shaft, the axes of the shafts being situated in one plane or in parallel planes and being tangent to a circular cylinder having an axis and a constant radius, two of the shafts of each block being rigidly fixed relative to each other while the remaining shaft of each block is adjustable with respect to the other two, the two blocks being capable of cooperating in an interconnected manner with one of said rods; and

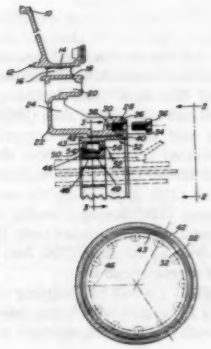
a third bearing block comprising two shafts, each shaft having an axis, and two ball bearings of the same diameter, one ball bearing mounted on each shaft, the axes of the shafts extending parallel to each other, one shaft being adjustable with respect to the other shaft, said block being capable of cooperating with the other rod and of being rigidly connected to one of the other two blocks.

4,457,568

BEARING SUPPORT STRUCTURE

William K. Crawford, Longueuil, and Ronnie Kovacik, St. Bruno, both of Canada, assignors to Pratt & Whitney Canada Inc., Longueuil, Canada

Filed Jan. 21, 1983, Ser. No. 460,003
Int. Cl.³ F16C *33/58*
U.S. Cl. 308—207 A **6 Claims**



1. A bearing support structure comprising an outer casing, at least one internal shaft means mounted for rotation in a plurality of bearings, at least one of said bearings being a roller-type bearing, bearing support means for said roller-type bearing mounted to the casing, the bearing support means defining a first annular seat concentric with the shaft means, a cylindrical solid sleeve forming an outer race member having at one end thereof an out-of-round outer raceway and the other end of said cylindrical solid sleeve being mounted in said first annular seat of said bearing support means such that the sleeve supports the bearings in a cantilevered manner and the preload on the bearing can be adjusted by varying the length and/or the thickness of the sleeve and/or by varying the degree of out-of-round of the outer raceway.

4,457,569

LOCK ARRANGEMENT FOR OFFICE FURNITURE UNITS

Douglas Scheerhorn, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Mar. 26, 1982, Ser. No. 362,454
Int. Cl.³ E05B *65/46*
U.S. Cl. 312—219 **75 Claims**

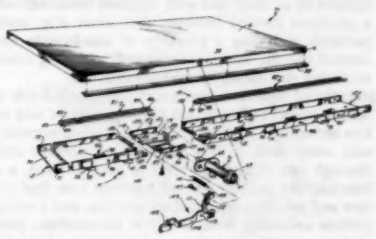
62. A lock arrangement for office furniture units such as desks, credenzas and the like, that include at least one closable compartment therein, such as a drawer, a cabinet, or the like, with means for locking said compartment closed, and a top extending the length of said unit, said lock arrangement comprising:

a removable primary lock positioned within said top to define an in-top lock arrangement, and having locked and unlocked positions;

a channel opening downwardly from a lower surface of said top; said channel being shaped to permit said primary lock to be removed and replaced from said unit through said channel;

means for detachably connecting said primary lock with said top by fasteners which are accessible only through said channel;

means for mechanically connecting said primary lock with



said compartment locking means, whereby shifting said primary lock between the locked and unlocked positions locks and unlocks said compartment; said connecting means being positioned within said channel;

a removable cover shaped to enclose said channel and prevent unauthorized access thereto;

means for selectively locking said cover over said channel in a closed position; said cover locking means being positioned wholly within said channel for security;

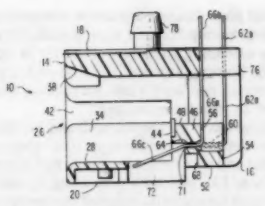
means for operably connecting said cover locking means with said primary lock, whereby shifting said primary lock between the locked and unlocked positions automatically locks and unlocks said cover, thereby permitting only authorized access to said locking arrangement and said removable primary lock.

4,457,570

CONNECTOR FOR MATING MODULAR PLUG WITH PRINTED CIRCUIT BOARD

Stephen B. Bogese, II, Roanoke, Va., assignor to Virginia Patent Development Corporation, Roanoke, Va.

Continuation-in-part of Ser. No. 120,846, Feb. 12, 1980, which is a continuation of Ser. No. 915,457, Jun. 14, 1978, abandoned. This application Dec. 10, 1980, Ser. No. 215,054
Int. Cl.³ H01R *13/00*
U.S. Cl. 339—17 C **89 Claims**



1. A modular jack for directly coupling to a printed circuit board a modular plug of the type which includes a dielectric housing having a free end for insertion into the modular jack, a cord input end having a cavity for receiving a multi-conduc-

tor cord, a resilient locking tab integrally connected by a flexible hinge to the free end of the dielectric housing and extending obliquely rearwardly therefrom, a terminal-receiving side having partitions which define side-by-side slots in communication with the cavity, electrically conductive, substantially flat contact terminals positioned within the slots and extending into the cavity, the contact terminals including insulation-piercing tangs for making electrical engagement with associated conductors of the cord and upper edge portions for making electrical contact external to the plug, the modular jack comprising:

an insulating housing having a front portion, a rear portion and an outer wall;

an opening formed in said front portion of said insulating housing for receiving the modular plug, said opening defined by an inner end wall, opposed inner side walls and a partition formed between said inner side walls, said partition including a plurality of side-by-side apertures formed therein, said inner end wall including conductor-receiving slot means formed therein; and

a plurality of electrical conductors arranged in a side-by-side spaced apart fashion in said housing, each of said conductors including a first end portion extending normally from said outer wall, a first intermediate portion extending through one of said apertures in said partition, a second intermediate portion formed between said first end portion and said first intermediate portion, and a second end portion extending from said first intermediate portion in said one of said apertures angularly into said opening and towards said conductor-receiving slot means in said end wall;

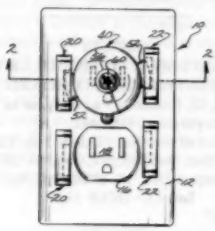
said second end portions of said plurality of conductors forming spring contacts that engage the upper edge portions of the contact terminals in the plug when the plug is inserted into the jack.

4,457,571

RETAINER APPARATUS FOR ELECTRIC PLUGS

Daniel J. Lavine, and Mary A. Lavine, both of 1162 Center St., Middleboro, Mass. 02346

Filed Aug. 14, 1981, Ser. No. 292,838
Int. Cl.³ H01R *13/44, 13/62*
U.S. Cl. 339—75 P **9 Claims**



1. Electrical plug retainer apparatus comprising a generally tubular housing having first and second ends, tab means including two tabs extending radially outwardly in opposite directions from the housing adjacent the first end, a plug retaining wall at the second end with a cut out portion therethrough to permit a cord to pass therethrough,

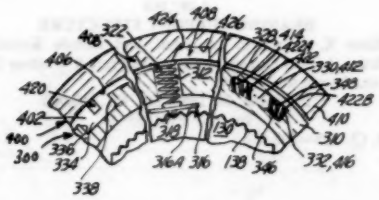
an escutcheon having a bottom wall and having a receptacle aperture defined therethrough, the aperture having a horizontal and a vertical axis, guide rail means including a pair of boss like elements projecting upwardly from the bottom wall on opposite sides of the receptacle aperture, each element having a top wall, two side walls, a back wall and a generally flat front wall facing the aperture and parallel to the vertical axis, a recessed channel formed in the front wall having a top rail surface spaced above the bottom wall of the escutcheon, the channel closed by the side walls, the two channels being angularly displaced on opposite sides of the horizontal axis, the tab means being pivotably movable to a position beneath the top rail surface to lock the housing to the escutcheon, a projection extending from a surface of each tab and a detent groove formed in the top rail surface of each top rail, the detent groove adapted to receive a respective projection therein.

4,457,572

COUPLING NUT FOR AN ELECTRICAL CONNECTOR

Margaret J. Frazier, Sidney, and Robert W. Brush, Sr., Unadilla, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sep. 30, 1982, Ser. No. 431,973
Int. Cl.³ H01R *13/629*
U.S. Cl. 339—89 M **12 Claims**



1. A coupling nut for an electrical connector of the type having first and second shells (**100, 200**) connectable in end-to-end relation, said first shell (**100**) including a plurality of ratchet teeth (**138**) and said second shell (**200**) including external thread (**220**), said coupling nut comprising a coupling sleeve (**310**) captivated for rotation about the first shell and including internal thread (**320**) for threadable coupling with the external thread (**220**) disposed on the second shell and a straight spring beam (**316**) having a medial tooth (**318**) normally in engagement with the ratchet teeth (**138**), rotation of the coupling nut drawing the shells (**100, 200**) axially together, said coupling nut characterized by:

a coil spring (**322**) carried by coupling sleeve (**310**) and cooperatively associated with spring beam (**316**) for biasing medial tooth (**318**) into engagement with ratchet teeth (**138**);

actuating means (**406, 408, 410**) operable between first and second positions, respectively, relative to the coupling sleeve for compressing and for relaxing the coil spring (**322**); and

bias means (**422, 330, 412**) for constantly biasing the coil spring into the first position.

4,457,573

TERMINAL-BUSHING ASSEMBLY

Charles H. Bailey, Readsboro, Vt., and Richard E. Cote, North Adams, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jun. 9, 1982, Ser. No. 386,547
Int. Cl.³ H02B *1/02*
U.S. Cl. 339—128 **10 Claims**

1. A terminal-bushing assembly comprising a metal-terminal strip; and a molded-plastic bushing having a main axis at right angles to an inner end and an outer end thereof and having a mounting means for mounting said bushing in a hole in a wall of an electrical-component housing with said axis perpendicular to said housing wall,

said terminal strip having a spade terminal formed at an outer end thereof for connection by a universal push-on-type electrical connector, said strip having a unifomly thick central portion that is tapered in an axial direction, the tapered edes of said central portion having a saw tooth

profile, and said strip having an inward-terminal portion to which said electrical component may be connected,

said central tapered and toothed portion of said terminal strip is located in a hole running axially through said bushing, said saw-toothed edges being embedded in oppo-

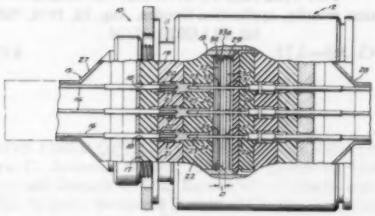
site wall portions of said hole, the space between the major wall surfaces of said bushing hole being greater than the thickness of said metal strip so that at least one of the major strip faces is for the most part spaced from the adjacent of said major wall surfaces.

4,457,574

ELECTROMAGNETICALLY SHIELDED CONNECTOR

Gerald E. Walters, Granada Hills, Calif., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Feb. 5, 1982, Ser. No. 346,281
Int. Cl.³ H01R *13/648*
U.S. Cl. 339—143 R **13 Claims**



1. An electromagnetic shield for an electrical connector within a metal shell and having an open end, comprising:

a first electrically conductive plate having its edges affixed to the metal shell and including at least one opening passing therethrough;

a second electrically conductive plate spaced from said first plate and having edge margins in continuous contact with a generally circular shoulder on the connector shell, said second plate including an opening aligned with the opening in said first plate and being located outwardly of the first plate; and

spring means resiliently maintaining the first and second plates at the predetermined spacing.

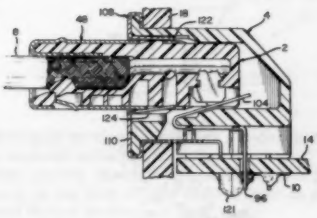
4,457,575

ELECTRICAL CONNECTOR HAVING IMPROVED SHIELDING AND KEYING SYSTEMS

Wayne S. Davis, Harrisburg, and Robert C. Swengel, Jr., York, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 21, 1982, Ser. No. 420,762
Int. Cl.³ H01R *13/648*
U.S. Cl. 339—143 R **6 Claims**

1. An electrical connector receptacle of the type comprising a molded insulating housing having a mating end, a rearward end, oppositely facing first and second housing sidewalls and oppositely facing housing endwalls extending from the mating end to the rearward end, a plug-receiving opening extending into the mating end, the opening having opposed first and second opening sidewalls, which are proximate to the first and second housing sidewalls, and opposed opening endwalls, a plurality of receptacle terminals in the receptacle, the terminals being arranged in a row which extends between the opening endwalls, each terminal having a cantilever spring contact portion which extends from the second opening sidewall at a location proximate to the mating end, the cantilever spring contact portions extending diagonally into the opening towards the inner end of the opening, the opening being dimensioned to receive a plug having plug terminals therein which contact the cantilever spring contact portions, the receptacle being characterized in that:



at least one key is provided on the first opening sidewall, the key having a leading end and an inner end, the leading end being proximate to, and spaced from, the mating end of the housing, the inner end being remote from the mating end of the housing,

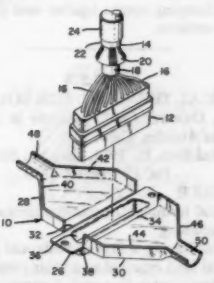
a stamped and formed sheet metal receptacle shield is provided on the housing, the receptacle shield extending over and covering, the mating end and extending to the plug-receiving opening, the receptacle shield having cantilever spring shield contact extensions extending into the plug-receiving opening for contacting the plug shield on a complementary plug upon insertion of the plug into the opening, the shield contact extensions being adjacent to the first opening sidewall.

4,457,576

ONE PIECE METAL SHIELD FOR AN ELECTRICAL CONNECTOR

Pete Cosmos, Mechanicsburg, and Brian D. Stephenson, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 17, 1982, Ser. No. 450,844
Int. Cl.³ H01R *13/648*
U.S. Cl. 339—143 R **17 Claims**



1. A metal shell for providing RF-EMI shielding for an electrical connector, said shell having a face portion and a pair

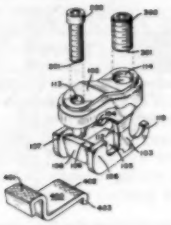
of shell portions, said face portion having an aperture exposing the mating face of said connector, said shell portions having interfitting depending side walls and a semi-cylindrical cable engaging neck, characterized by said shell portions being connected to opposite sides of said face portion by respective bights, said shell portions being brought together with said side walls interfitting to enclose said connector and cable.

4,457,577

CABLE TRAY GROUND CLAMP

Frank L. Browne, Bristol, and Walter W. Bachle, Harwinton, both of Conn., assignors to General Signal Corporation, Stamford, Conn.

Filed Sep. 7, 1982, Ser. No. 415,128
Int. Cl.³ H01R *4/66*
U.S. Cl. 339—14 L **5 Claims**



1. A grounding lug for electrically coupling a ground wire and a cable tray, or the like, which comprises:

(a) a body member fabricated of a high-yield strength material and including an anvil portion at the bottom and an opposing top portion joined as an integral structure by a first side member;

(b) said anvil portion being "L" shaped in cross-section and having a leg along said bottom and an upstanding leg, said anvil portion including first and second anvil surfaces on said bottom leg and on the end of said upstanding leg;

(c) said top portion including first and second t hreaded holes opposite to said first and second anvil surfaces, respectively, for supporting first and second threaded clamping means;

(d) a grounding bar conforming to the shape of said anvil portion and having an end with a hook into which said upstanding leg extends, said grounding bar being fabricated of a material having a low-yield strength and superior electrical conducting characteristics, both as compared with said body member; and

(e) said grounding bar overlays said first and second anvil surfaces; whereby said grounding bar provides a low resistance electrical path between the cable tray or the like, clamped by said first threaded clamping means and the ground wire or the like, clamped by said second threaded clamping means against said grounding bar and said anvil surfaces.

4,457,578

ELECTRICAL TERMINAL FOR SOLAR PANEL

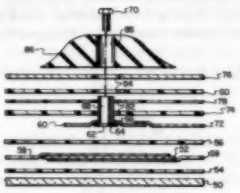
Dan E. Taylor, Oxnard, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 21, 1981, Ser. No. 333,210
Int. Cl.³ H01R *4/30*
U.S. Cl. 339—263 R **5 Claims**

1. An electrical terminal for use in a laminated photovoltaic solar panel comprising:

a terminal post having a first end adapted for connection to an electrical lead external to a solar panel and a generally flattened flange extending radially outward from a second end, and

a substantially flat terminal plate formed from a metal sheet and adapted for bonding within the laminated photovoltaic solar panel, said plate having an aperture through which said terminal post is positioned to extend from a



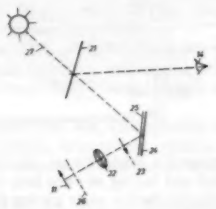
first side of said plate and said flange welded to a second side of said plate.

4,457,579

ARRANGEMENT TO REDUCE INFLUENCE OF DIFFUSE AND DIRECT REFLECTIONS IN A DISPLAY DEVICE BASED ON A SOURCE OF LIGHT EMITTING IN A NARROW BAND

Lars H. Thylén, Huddinge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE79/00172, § 371 Date Apr. 15, 1980, § 102(e) Date Mar. 20, 1980, PCT Pub. No. WO80/00499, PCT Pub. Date Mar. 20, 1980
PCT Filed Aug. 14, 1979, Ser. No. 193,263
Claims priority, application Sweden, Aug. 15, 1978, 7808662
Int. Cl.³ G02B *27/14*
U.S. Cl. 350—3.72 **6 Claims**



1. Holographic display equipment for generating an image in the field of view of an observer, comprising: a symbol source means for emitting monochromatic light of substantially a given wavelength; a holographic optical means in the field of view of an observer, said holographic optical means being arranged for generating an image by means of reflecting light of said given wavelength coming from a focal plane; a lens system means for generating an image of said symbol source means in said focal plane; reflecting means in the beam path between said symbol source means and said holographic optical means; and filter means immediately adjacent said reflecting means for decreasing the influence of diffuse reflections in the equipment, said filter means comprising an absorption band-pass filter in the beam path between said reflecting means and said holographic optical means, a pass band of the absorption filter having its center frequency substantially at the wavelength of the emitted monochromatic light and a bandwidth substantially greater than the bandwidth of said symbol source means and less than the bandwidth of reflection of said holographic optical means.

4,457,580

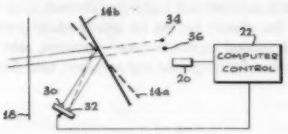
DISPLAY FOR ELECTRONIC GAMES AND THE LIKE INCLUDING A ROTATING FOCUSING DEVICE

George J. Klose, Lomita, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Division of Ser. No. 167,569, Jul. 11, 1980, abandoned. This application Feb. 24, 1983, Ser. No. 469,379

Int. Cl.³ G02B *27/18, 27/14*

U.S. Cl. 350—6.91 1 Claim



1. A display comprising a mirror, means for rotating the mirror about an axis, position means for determining the angular position of the mirror, first and second light sources designed to radiate light of first and second primary colors, respectively, the light sources positioned adjacent each other in a line perpendicular to the axis of rotation of the mirror, each light source being oriented to radiate light onto a surface of the mirror, from where the light is reflected onto a focusing plane at a point which is a function of the angular position of the mirror, and control means operatively connected to the light sources and responsive to the position means for energizing the first and second light sources at peredetermined angular positions of the mirror to cause the light from both the first and second light sources to appear at the same point on the focusing plane to produce an image having a third color.

4,457,581

PASSIVE FIBER OPTIC DATA BUS CONFIGURATIONS

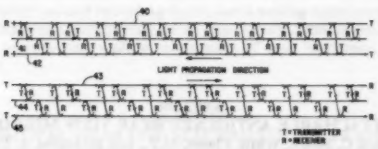
Derwyn C. Johnson, Ottawa; Brian S. Kawasaki, Carleton Place, and Kenneth O. Hill, Kanata, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Canada

Filed Oct. 27, 1981, Ser. No. 315,369

Claims priority, application Canada, Nov. 26, 1980, 365491

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.16 5 Claims



1. A serial data bus for interconnecting a plurality of terminals comprising six optical fibers arranged in two groups of three fibers each, said groups conducting light in mutually opposite directions, each terminal having light transmitting and receiving means connected to predetermined fibers by optical couplers, the transmitting means in each terminal being coupled to two of the fibers in each group of three fibers, the transmitting means of terminals adjacent any one terminal being connected to a different two fibers than the transmitting means of said one terminal.

4,457,582

FIBRE OPTIC TERMINALS FOR USE WITH BIDIRECTIONAL OPTICAL FIBRES

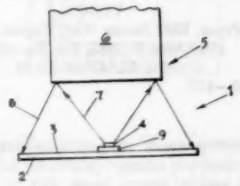
Edward L. Lewis, Maidstone; Robin D. Beasley, Chatham, and Trevor A. Morgon, Rainham, all of England, assignors to Elliott Brothers (London) Limited, London, England

Filed Nov. 29, 1978, Ser. No. 964,679

Claims priority, application United Kingdom, Dec. 23, 1977, 53688/77

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.20 13 Claims



1. A fibre-optic terminal for use with a bi-directional optical fibre, the terminal including:

an optical receiver having a light receiving area positioned directly in the path of light emitted from an end of the optical fibre to receive said light; and

an optical emitter including an area at a position adjacent said optical receiver from which light is emitted onto said end of the optical fibre, said position being directly in the path of light emitted from said end of the optical fibre so that substantially all of the light emitted from said optical emitter is directly incident on said end of the optical fibre, and so that the emitter prevents some light from striking the optical receiver from the optical fibre, said area from which said optical emitter emits light being small relative to said light receiving area of said optical receiver so that the light emitted from said end of the optical fibre except for that striking the emitter is directly incident on said light receiving area of said optical receiver whereby the amount of light blocked by the emitter is small in comparison with the amount of light incident on the light receiving area of the optical receiver.

4,457,583

METHOD OF MAKING AN OPTICAL FIBER CABLE

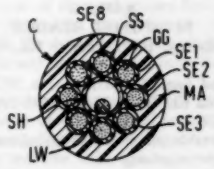
Ernst Mayr, Starnberg, and Ulrich Oestreich, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 27, 1981, Ser. No. 267,665

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024310

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.23 15 Claims



1. A method for manufacturing an optical cable having support elements, which consists of stranded threads impregnated with a hardening resin and covered by a protective layer, being stranded onto a protective covering containing a light

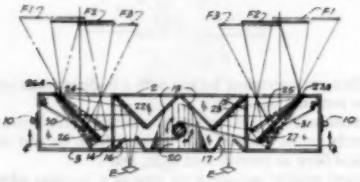
waveguide, said method comprising the steps of providing each of the support elements by providing a plurality of threads, stranding said threads together into a group, impregnating each of the groups of stranded threads with a hardening resin, subsequently covering each of the impregnated groups with a protective layer to produce the support element; subsequently providing a light waveguide received in a protective covering; and stranding the support elements onto the protective covering of the waveguide to form the cable, said protective layer permitting a subsequent hardening of the resin.

4,457,584

STEREOSCOPIC VIEWER WITH VARIABLE FIELDS OF VISION

Eugene F. Pryor, 5035 Nectar Way, Eugene, Oreg. 97405

Filed Mar. 8, 1982, Ser. No. 355,527
Int. Cl.³ G02B *27/24*
U.S. Cl. 350—137 **8 Claims**



1. A stereoscope for viewing spaced apart stereo photographic images and comprising in combination,

a main body including a housing including a front wall and a rear wall defining respectively a pair of front wall sight openings and a pair of rear wall sight openings,

a first pair of reflectors within said housing,

a second pair of reflectors within said housing each reflector of said second pair hingedly mounted within said housing,

the pairs of reflectors orientated to reflect light waves along separate paths toward a user's eyes located proximate said rear wall sight openings, and

mirror control means coupled to the hingedly mounted pair of mirrors whereby the field of vision of each eye of the viewer may be altered to permit viewing of stereo images throughout a range of spaced apart distances and throughout a wide range of image sizes spaced forwardly at random distances from the stereoscope, said control means further including biasing members of a resilient nature coupled to the main body and to said hingedly mounted pair of mirrors to individually bias same in a first direction, said control means further including tensionable members also coupled to said hingedly mounted pair of mirrors, a control member for manipulation by the user and acting on said tensionable members to impart movement to same to bias the hingedly mounted mirrors coupled thereto in a second or opposite direction.

4,457,585

MAGNIFIER READER

Gerard M. DuCorday, 10871 Thorley Rd., Santa Ana, Calif. 92705

Filed Aug. 31, 1981, Ser. No. 297,980
Int. Cl.³ G02B *27/02, 7/04, 3/08*
U.S. Cl. 350—235 **5 Claims**

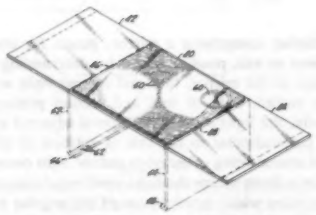
1. A clear, portable, one-piece, page size, and self-supporting magnifier reader comprising

a substantially page size top member adapted to be positioned parallel to and fixedly spaced from a page of a document to be read, said top member being formed of a rigid, clear, transparent, and flat member,

first and second legs joined to said top member for supporting said top member at a predetermined distance from and upon said page to be read, said legs being transparent for unobstructed transmission of ambient light to said page, the upper ends of said legs being coextensive with front and back edges respectively of said top member and forming therewith an inverted U-shaped and fully transparent rigid frame, and

a Fresnel lens formed in and substantially coextensive with said top member, whereby a magnified image of said page may be read solely with ambient light and with minimum movement of said reader over said page,

said top member and legs being formed of an integral sheet of flat plastic having an intermediate portion and first and second opposite outer portions, said intermediate portion forming said top member, said first and second



outer portions forming said legs and being bent relative to said intermediate portion along mutually spaced parallel lines defining outer portions of said top member,

said intermediate portion of said plastic sheet having a plurality of grooves formed therein, said grooves collectively forming said Fresnel lens, whereby said lens is an integral part of said magnifier reader,

said legs each having a free end portion bent to extend at an angle relative to such leg to provide an extended foot therefor, said foot being provided with indicia useful in reading a page with said magnifier reader, the image of said indicia viewed through said lens being magnified thereby.

4,457,586

ATTACHABLE ANTIGLARE REAR VIEW MIRROR

Bernard C. Sharp, White Plains, N.Y., and Raymond J. Evans, Naugatuck, Conn., assignors to Parker-Hannifin Corporation, Shelton, Conn.

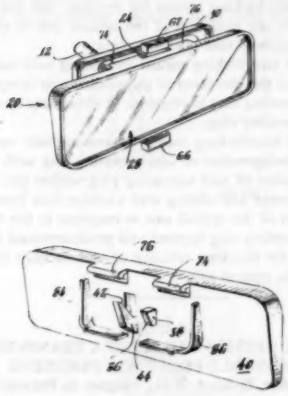
Filed Jul. 22, 1982, Ser. No. 400,737
Int. Cl.³ G02B *17/00*
U.S. Cl. 350—281 **5 Claims**

1. An antiglare motor vehicle rear view mirror assembly comprising:

a mirror unit operable between two angularly-displaced reflective positions;

first and second cam followers associated with said mirror unit; and

a cam lever comprising first and second cams operable with said first and second cam followers to move said mirror



unit between said operable positions, said cam followers being formations on a rear wall of said mirror unit.

4,457,587

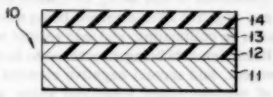
REFLECTOR AND METHOD FOR MANUFACTURING THE SAME

Shitomi Katayama; Hajime Shimabukuro, both of Yokohama; Suguru Nomura, Chigasaki; Hiroyuki Kurita, and Akira Ohno, both of Yokohama, all of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Dec. 22, 1981, Ser. No. 333,282

Int. Cl.³ G02B *5/08*; B05D *5/06, 3/04*; B21D *39/00*

U.S. Cl. 350—288 **29 Claims**



1. A reflector comprising a base body made of a metallic material having substantially the same ionization potential as that of aluminum, an aluminum reflecting layer vacuum deposited on one surface of said base body directly or through a smoothing layer formed on the base body, a light-transmitting water-formed insoluble inorganic oxide layer directly vacuum deposited on said reflecting layer, and a sealing agent comprising H_2O or a carboxylate of an iron family element having a low valence and sealing micropores of said inorganic oxide layer.

4,457,588

REMOVAL OF STATIC ELECTRICITY ON A LIQUID CRYSTAL DISPLAY DURING RUBBING PROCESS

Yozo Yasukawa, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 24, 1979, Ser. No. 32,773

Claims priority, application Japan, Apr. 25, 1978, 53-49685

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—336 **3 Claims**

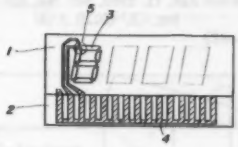
1. An intermediately formed substrate used in the ultimate manufacture of a liquid crystal display cell, comprising:

a substrate; and

an electrode configuration formed on said substrate, said electrode configuration including a plurality of display segment electrodes and a plurality of electrode leads electrically connected to said display segment electrodes,

said electrode leads extending to a point near an edge of said substrate;

a short circuiting bar means connected to one end of the electrode leads and arranged along said edge of said substrate for substantially eliminating an electrical potential developed between the electrode leads;



whereby said short circuiting bar means prevents arc discharge between the display segment electrodes during the manufacture of said liquid crystal display cell and is adapted to be separated from said electrode leads upon the completion of the manufacture of the liquid crystal display cell.

4,457,589

ELECTRO-OPTIC DEVICE WITH PARTICULAR LOCATION OF ELECTRODE CROSS-OVERS

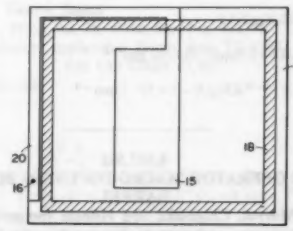
Katsuhide Tamura, Soka, and Yuichi Masaki, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1982, Ser. No. 341,807

Claims priority, application Japan, Feb. 16, 1981, 56-21125

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—336 **34 Claims**



1. An electro-optic device comprising:

a pair of electrode plates including a first electrode plate provided with a common electrode having a first lead wire and a second electrode plate facing said first electrode plate, said second electrode plate being provided with a counterelectrode having a second lead wire, and one of said pair of electrode plates having a protruding portion provided with a terminal electrode and a shortcircuit electrode, the shortcircuit electrode being electrically connected to said first lead wire from the common electrode;

a seal spacer provided between said pair of electrode plates positioned at an outer peripheral portion of each of said pair of electrode plates, said seal spacer defining an inner and an outer seal line, such that cross-overs between said first lead wire from the common electrode and the said second lead wire from the counterelectrode are formed inside the outer seal line and the electrical connection of the shortcircuit electrode with said first lead wire from the common electrode is formed outside the inner seal line; and

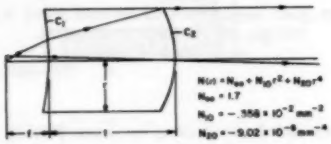
an electro-optic substance provided between said pair of electrode plates inside the inner seal line defined by said seal spacer.

4,457,590

SPHERICAL GRADIENT-INDEX LENS DESIGNS FOR VIDEO-DISK PICKUP LENS OR THE LIKE

Duncan T. Moore, Rochester, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jan. 11, 1982, Ser. No. 338,477
Int. Cl.³ G02B 3/00
U.S. Cl. 350—413 **6 Claims**



1. A singlet lens having a thickness t and including opposing first and second refracting surfaces having spherical curvatures C_1 and C_2, respectively, and a radial refractive index gradient wherein the refractive index N of the lens varies with radial distance r from the optical axis of the lens approximately according to the power series expansion formula:

$$N(r) = N_{00} + N_{10}r^2 + N_{20}r^4$$

wherein the lens parameters C_1, C_2, t, N_{00}, N_{10} and N_{20} are within the following ranges:

$$0.09 \leq C_1 \leq 0.14\ mm^{-1}$$

$$-0.04 \leq C_2 \leq 0.05\ mm^{-1}$$

$$8 \leq t \leq 15\ mm$$

$$1.35 \leq N_{00} \leq 1.9$$

$$-0.0045 \leq N_{10} \leq -0.0030\ mm^{-2}$$

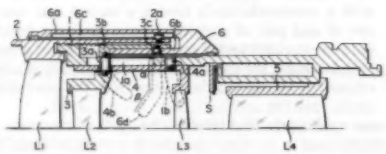
$$-1 \times 10^{-4} \leq N_{20} \leq -1 \times 10^{-7}\ mm^{-4}$$

4,457,591

SINGLE OPERATOR MACRO-FOCUSING ZOOM LENS BARREL

Takeshi Muryoi, Chigasaki, and Hitoshi Imanari, Funabashi, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 4, 1982, Ser. No. 354,901
Int. Cl.³ G02B 7/10, 15/18
U.S. Cl. 350—430 **4 Claims**



1. A lens barrel including a focusing lens system and a variator lens system, thereby enabling focusing from infinity to a short distance, focusing from a short distance to a very short distance shorter than the short distance and magnification change, said lens barrel comprising:

(a) an operating ring rotatable about an optical axis within a predetermined range for the focusing from infinity to the short distance, further rotatable beyond said predetermined range for the focusing from the short distance to the very short distance and slidable in the direction of the optical axis for the magnification change;

(b) first interlocking means for moving said focusing lens system in the direction of the optical axis in response to the rotation of said operating ring;

(c) second interlocking means for sliding said variator lens system in the direction of the optical axis integrally with said operating ring in response to the sliding movement of said operating ring;

(d) a third interlocking means for making said variator lens system independent of said operating ring with respect to the rotation of said operating ring within said predetermined range and sliding said variator lens system in the direction of the optical axis in response to the rotation of said operating ring beyond said predetermined range; and

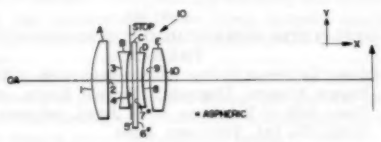
(e) means for blocking rotation of said variator lens system about the optical axis.

4,457,592

OPTICAL SYSTEM UTILIZING A TRANSVERSELY MOVABLE PLATE FOR FOCUSING

James G. Baker, Bedford, N.H., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 3, 1981, Ser. No. 326,850
Int. Cl.³ G02B 9/60, 13/18
U.S. Cl. 350—432 **9 Claims**



1. A five element, variable focus, photographic objective comprising:

four fixed elements of form positive, negative, negative, positive positioned in line along an optical axis, said first positive and negative fixed elements being structured to in combination be collimating, and said second negative and positive fixed elements being structured to in combination be convergent, said second negative element having one surface of predetermined rotational shape and another surface which is a nonrotational asphere in shape; and

a refracting plate following said first fixed negative element of said objective and movable laterally across said optical axis, said refracting plate having at least one surface which is a nonrotational asphere in shape and faces said aspheric surface of said second negative fixed element, said aspheric surface of said refracting plate being operative to in combination with said opposed fixed aspheric surface of said second fixed negative element to provide said objective with a continuous range of dioptric power as said refracting plate moves across said optical axis over a predetermined range of distance.

4,457,593

PHOTOGRAPHIC LENS SYSTEM

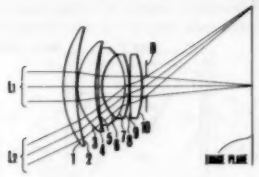
Hideo Yokota, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

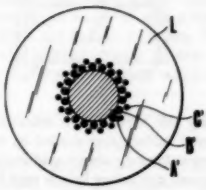
Filed Feb. 18, 1981, Ser. No. 235,644
Claims priority, application Japan, Feb. 19, 1980, 55-19418
Int. Cl.³ G02B 9/34, 9/60
U.S. Cl. 350—448 **2 Claims**

1. A photographic objective lens system, comprising:

front optical means having a plurality of optical components, a diaphragm arranged at the image side of said front optical means, a light absorbing layer provided at a surface at the optical components other than the surface

adjacent the diaphragm and having a central elementary region, and a plurality of outer elementary regions on the light absorbing layer adjacent a circumference of said central elementary region, said central region and said outer regions being separated from each other;





said front optical means comprising, from front to rear, two positive meniscus lenses of forward convexity, a negative meniscus lens of forward convexity, a negative meniscus lens of forward concavity, and a bi-convex lens, and said central elementary region and said outer elementary region lying on one of the first to the sixth lens surfaces counting from the front.

4,457,594

FRESNEL LENS PROJECTION SYSTEM WITH HIGH GAIN SCREEN

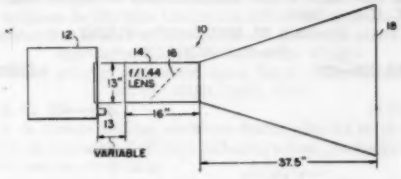
Marvin P. Hodges, St. Petersburg, Fla., assignor to B Optical, St. Petersburg, Fla.

Continuation-in-part of Ser. No. 185,290, Sep. 8, 1980, abandoned. This application Feb. 18, 1982, Ser. No. 350,000

Int. Cl.³ G03B *21/56*; G02B *3/08*

U.S. Cl. 350—452 **34 Claims**

1. A projection system of the type useful in projecting an image or series of images from an image source comprising means including a screen having a gain greater than 13 for displaying images, means for providing an image source, a lens system having a plurality of spaced apart elements, said lens system having an aspect ratio of 3:4, an apparent speed of substantially f/1.4 and a focal length of substantially 280 mm, at least one of said plurality of elements being disposed in substantially parallel relation to said image source means, and another one of said plurality of elements disposed substantially



orthogonally relative to at least one other of said plurality of elements.

4,457,595

LARGE RELATIVE APERTURE TELEPHOTO LENS SYSTEM

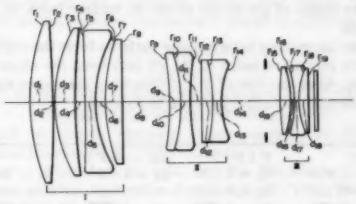
Shinichi Mihara, Hachiooji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1982, Ser. No. 401,949

Claims priority, application Japan, Aug. 12, 1981, 56-125218

Int. Cl.³ G02B *13/02*

U.S. Cl. 350—454 **10 Claims**

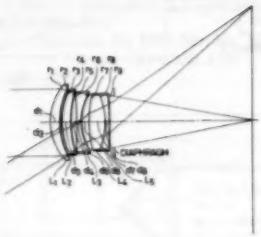


1. A large relative aperture telephoto lens system comprising a first converging lens group comprising a positive lens component, a positive lens component, a negative lens component and a positive lens component, a diverging lens group comprising two negative cemented doublet lens components and a second converging lens group comprising a positive lens component, a negative lens component and a positive lens component, and so designed as to perform focusing while favorably correcting aberrations by displacing the two negative cemented doublet lens components independently of each other toward the image side while varying the airspace reserve therebetween in said diverging lens group and additionally displacing said second converging lens group independently of both said cemented doublet lens components.

4,457,596
BEHIND DIAPHRAGM LENS

Koichi Wakamiya, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,262
Int. Cl.³ G02B 9/34
U.S. Cl. 350—472 4 Claims



1. In a four-unit five-lens lens system wherein in succession from the object side, each of a first lens and a second lens comprise a positive meniscus lens having its convex surface facing the object side, a third lens comprises a biconcave lens, a fourth lens comprises a biconvex lens, a fifth lens comprises a negative meniscus lens having its convex surface facing the image side, the fourth lens and the fifth lens being cemented together to form a positive cemented lens, and a diaphragm is provided most adjacent to the image side, a behind diaphragm lens satisfying the following conditions:

(1) $0.7<f_{1,2}/f_{4,5}<1.4$
(2) $26.0<\nu_3<36.0$
(3) $49.8<\nu_1<59.0$
(4) $\nu_4<\nu_5$
(5) $0.05<r_1/f_1<0.40$
(6) $0.20<r_3/f_2<0.55$
(7) $3.0<r_5/f_3<11.0$
(8) $0.65<r_7/f<0.95$
(9) $1.04<n_4/n_5<1.12$

where

f: the composite focal length of the lens
f_i: the focal length of the ith lens from the object side
$f_{i,j}$: the composite focal length of the ith to jth lenses from the object side
r_i: the radius of curvature of the ith surface from the object side
d_i: the ith spacing between lens surfaces from the object side
n_i: the refractive index of the ith lens from the object side
ν_i: the Abbe number of the ith lens from the object side; and

wherein numerical data are as follows:

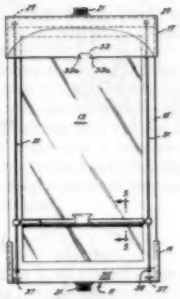
f = 100	F 2.8	2ω = 62.3°	
r_1 = +31.974	d_1 = 5.7250	n_1 = 1.713	ν_1 = 54.0
r_2 = +46.733	d_2 = 0.5725		
r_3 = +38.655	d_3 = 5.1525	n_2 = 1.77279	ν_2 = 49.4
r_4 = +72.381	d_4 = 2.4331		
r_5 = −264.361	d_5 = 2.5762	n_3 = 1.68893	ν_3 = 31.1
r_6 = +28.170	d_6 = 4.2937		
r_7 = +83.665	d_7 = 8.5875	n_4 = 1.77279	ν_4 = 49.4
r_8 = −31.587	d_8 = 2.2900	n_5 = 1.62041	ν_5 = 60.4
r_9 = −192.429			
Back focal length			76.3
Total length of the lens			107.9
f_1 = 122.3			
f_2 = 100.6			
f_3 = −36.8			
$f_{1,2}$ = 56.9			
$f_{4,5}$ = 59.3			
Petzval sum 0.00205			

where n_1, n_2, . . . represent the refractive indices of the successive lenses for d-line (λ=587.6 nm).

4,457,597
SELF CLEANING SIDE VIEW MIRROR

Thomas L. DeGideo, 2705 Veser La., Willow Grove, Pa. 19090

Filed Dec. 29, 1982, Ser. No. 454,277
Int. Cl.³ B60S 1/14
U.S. Cl. 350—582 10 Claims

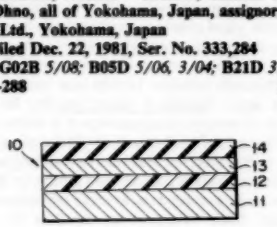


1. A self cleaning side view mirror assembly comprising:
a reflective mirrored surface surrounded by a frame;
a first elongate cap extending above said frame;
a second elongate cap extending below said frame;
a pair of guide rods extending between said first and second caps, one each at either side of said frame and in front thereof;
a cross bar supported between said guide rods for sliding therealong; and
a wiper carried on said cross bar and engagable with said mirrored surface.

4,457,598
REFLECTOR AND METHOD FOR MANUFACTURING THE SAME

Hajime Shimabukuro; Shuichi Watanabe; Shitomi Katayama, and Akira Ohno, all of Yokohama, Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Dec. 22, 1981, Ser. No. 333,284
Int. Cl.³ G02B 5/08; B05D 5/06, 3/04; B21D 39/00
U.S. Cl. 350—288 26 Claims



1. A reflector comprising a base body exhibiting dielectric property at least at its surface, an aluminum reflecting layer vacuum deposited on one surface of said base body directly or through a smoothing layer, a light-transmitting water-insoluble inorganic oxide layer directly vacuum deposited on said reflecting layer, and a sealing agent comprising H_2O or a carboxylate of an iron family element having a low valence and sealing micropores of said inorganic oxide layer.

4,457,599
COMPOSITE PHOTOGRAPHY APPARATUS AND METHOD

Walter M. Sawicki, 724 Cambridge Dr., Burbank, Calif. 91504

Filed Aug. 11, 1982, Ser. No. 407,060
Int. Cl.³ G03C 1/00
U.S. Cl. 352—89 7 Claims

1. Apparatus for use in composite photography comprising the combination of:

a motion picture camera having a lens and a length of film for recording images thereon via said lens;

a beam splitting means carried on said camera and having optical elements substantially lying along the optical axis of said lens;

a background means in spaced relationship to said camera and disposed behind a subject intended to be recorded on said film; and

said optical elements including a beam splitting element for optically dividing an image of said subject into a pair of identical images and further including filter elements for modifying said pair of images so that each image and background therefor is reversed when recorded on said length of film.

4,457,600

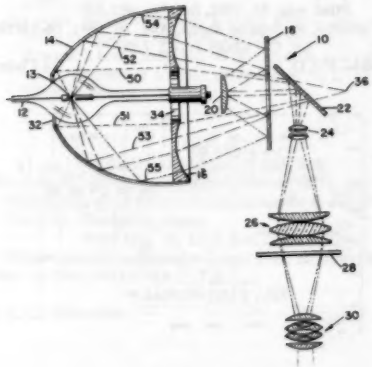
LIGHT PROJECTION SYSTEMS

Joseph F. Hall, 26098 Getty Dr., Laguna Niguel, Calif. 92677

Filed Oct. 13, 1981, Ser. No. 310,528

Int. Cl.³ G03B *21/00*

U.S. Cl. 353—122 **7 Claims**



1. In combination:

a lens exhibiting a given value of amplification at one region and a given greater value of amplification at a second region and exhibiting amplification variable from said given value to said greater given value in successively arranged regions between said one region and said second region;

a light source;

a reflector positioned to receive light from said source and being curved to direct said light from the several regions of the reflector through the several regions of the lens to a common focal point; and

further comprising a first mirror and a second mirror, the first positioned to reflect light from some of the several regions of the lens to the second mirror, and the second positioned to reflect rays from the first in the direction of said common focal point.

4,457,601

CAMERA WITH ELECTRICAL SHUTTER

Isao Kondo, and Yukio Nakajima, both of Hachioji, Japan, assignors to Olympus Optical Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 47,215, Jun. 11, 1979, abandoned. This application Jul. 22, 1982, Ser. No. 401,004

Claims priority, application Japan, Jul. 5, 1978, 53-82324

Int. Cl.³ G03B *7/083, 15/05*

U.S. Cl. 354—418 **15 Claims**

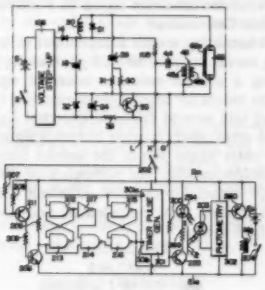
1. A camera with an electrical shutter adapted to be used with an electronic flash unit including a flash discharge tube; said camera con.prising:

a photometric circuit including a light receiving element which adapted to effect through-the-lens photometry;

a shutter;

an electrical shutter control circuit which is responsive to an output of the photometric circuit for normally closing said shutter;

auxiliary shutter closing means for receiving a first electrical signal supplied by the electronic flash unit in response to occurrence of the flashlight illumination of the flash discharge tube;



said auxiliary shutter closing means including timer circuit means for sensing a shutter release operation and in response thereto for producing a second signal after a predetermined time period when the amount of light received by said photometric circuit during a flash photography operation is insufficient; and

said auxiliary shutter closing means being responsive to said first and second signals to operate said shutter control circuit through the photometric circuit to close said shutter.

4,457,602

MULTIPLE LIGHT EMISSION CONTROL SYSTEM UTILIZING ELECTRONIC FLASHES

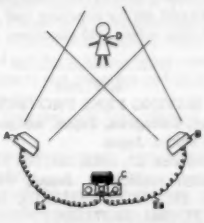
Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Apr. 16, 1982, Ser. No. 369,153

Claims priority, application Japan, Apr. 20, 1981, 56-59418; Apr. 20, 1981, 56-59419

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—416 **16 Claims**



1. A multiple light emisaion control system for operating a plurality of independent electronic flash means, said system

comprising:

each of said flash means being coupled to said control system to enable independent positioning of each flash means relative to the camera and to the object being photographed;

means for energizing all of said electronic flash means substantially simultaneously responsive to a signal indicating the opening of the shutter of a camera associated with said control system;

each of said electronic flash means having means for terminating the emission of flash light therefrom in response to receipt of an emission interrupt signal;

said control system including photometry means for controlling photometry of reflected light from an object being photographed which passes through a taking lens of a camera for generating a signal representing the reflected light;

first determining means responsive to said photometry means for determining a point in time when a desired amount of exposure has been reached for generating a shutter closing signal;

means responsive to said shutter closing signal for applying a first emission interrupt signal to a selected one of said electronic flash means;

second determining means independent of said first determining means coupled to said photometry means for developing a second emission interrupt signal, including selection means for selectively controlling the time occurrence of said second emission interrupt signal relative to the first mentioned emission interrupt signal over a range whose outer limits permit the second interrupt signal to occur before or after the occurence of the first emission interrupt signal for thereby adjusting the proportional amount of flash light provided by said plurality of electronic flash means.

4,457,603

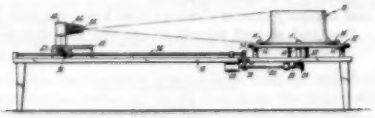
360° VIEW CAMERA

John R. Gebhart, Enfield, Conn., and Francis X. Ledoux, Springfield, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 26, 1982, Ser. No. 411,949

Int. Cl.³ G03B *37/00*

U.S. Cl. 354—80 **4 Claims**



1. A camera and fixture for photographing a cylindrical or conical surface of a test speciment to obtain a developed 360° view thereof including frame means for supporting the camera and the specimen in aligned relationship, said camera including a lens, a magazine for housing film, a cylinder for receiving said film and holding said film in a cylindrical position disposed in aligned relationship with said lens, a slit in said magazine exposing said film in view of said specimen, and means for synchronously rotating said cylinder and said specimen a revolution relative to said slit for exposing said film a substantially complete revolution when said specimen attains a complete revolution.

4,457,604

CAMERA HAVING LENS PROTECTION COVER

Takayuki Tsuboi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,606

Claims priority, application Japan, Feb. 27, 1981, 56-27320[U]; Feb. 27, 1981, 56-27321[U]; Feb. 27, 1981, 56-27322[U]; Feb. 27, 1981, 56-27323[U]

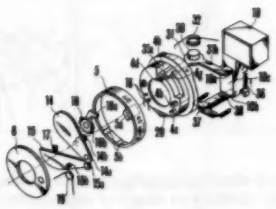
Int. Cl.³ G03B *11/04, 15/05, 17/18*

U.S. Cl. 354—145.1 **7 Claims**

1. In a camera, an improvement comprising:

(a) a lens protection member provided on the camera so as to be movable between a first position at which said member protects the front face of the photographing lens provided on the camera and a second position at which said member retires from the front face of the photographing lens;

(b) an operation member for changing over the photographing mode from the ordinary photographing mode to another photographing mode by changing over from a first state to a second state; and



(c) a lock member in operative engagement with the movement of the lens protection member for locking the operation member in the first state when the lens protection member is at the first position.

4,457,605

CAMERA WITH A MOTOR DRIVEN FILM TRANSPORT DEVICE

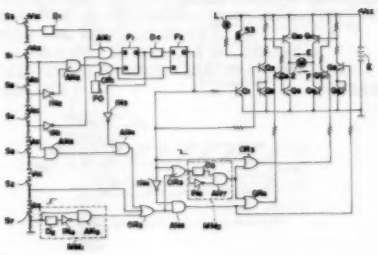
Koji Yamamoto, Sakai, and Fumio Yoshida, Kawachinagano, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 13, 1982, Ser. No. 407,939

Claims priority, application Japan, Aug. 26, 1981, 56-134595

Int. Cl.³ G03B *17/42, 1/00*

U.S. Cl. 354—173.11 **14 Claims**



1. A camera, in which a film is transported by the drive force of a motor and which includes a shutter, comprising:

a motor;

a film drive mechanism for winding-up the film;

a shutter drive mechanism for cocking the shutter;

a transmitting mechanism including a first and second transmitting means for transmitting the drive force of said motor separately to said film drive mechanism and said shutter drive mechanism, said film drive and shutter drive mechanisms being arranged to complete their operations almost simultaneously when the film is wound up mormally;

a first detecting means for detecting the operation of the film drive mechanism and generating a first detecting signal when the film wind-up is completed;

a second detecting means associated with the mechanism between the motor and the shutter drive mechanism, for generating a second detecting signal when shutter cocking is completed; and

a discriminating means for generating a third detecting signal

when the second detecting signal is generated before the generation of the first detecting signal.

4,457,606

MOTOR DRIVE UNIT FOR CAMERA

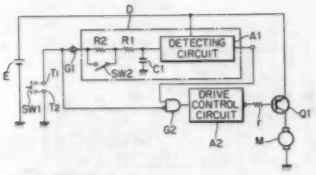
Kenji Ishizaki, Tokyo; Sakuji Watanabe, Warabi, and Koichi Daitoku, Sagamihara, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,834

Claims priority, application Japan, Feb. 1, 1982, 57-13333

Int. Cl.³ G03B *1/18*

U.S. Cl. 354—173.11 **10 Claims**



1. A motor drive unit capable of being coupled to a camera by being mounted on said camera to drive the film advance device of the camera after completion of exposure, said motor drive unit comprising:

(a) means provided to identify the type of said camera in response to the mounting of said motor drive funit onto said camera;

(b) means producing a drive signal for driving said film advance device in response to said signal for transmitting said completion of exposure, said drive signal producing means including means for adjusting the time of production of said drive signal in response to said identifying means; and

(c) drive means including a drive source and capable of being coupled to said film advance device by said motor drive unit being mounted on said camera, said drive means being responsive to said drive signal to drive said film advance device.

4,457,607

EASY LOADING CAMERA

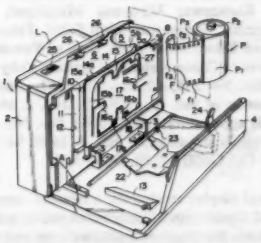
Jiro Sekine; Hiroshi Komatsuzaki; Hiroshi Hara, and Nobuyuki Kameyama, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 18, 1982, Ser. No. 434,929

Claims priority, application Japan, Oct. 20, 1981, 56-167562; Oct. 20, 1981, 56-167563

Int. Cl.³ G03B *1/48*

U.S. Cl. 354—203 **3 Claims**



1. A photographic camera comprising a magazine receiving chamber formed in the camera body on one side of a film aperture and shaped to permit insertion of a film magazine having a film leader thereinto in one axial direction of the magazine, a film leader guiding means for guiding the film leader into the film feeding path between the film aperture and a pressure plate opposed thereto as the magazine is inserted into the chamber, and film feeding means having an engaging member which engages with perforations of the film to feed it, in which said film leader guiding means comprises inner and outer guide members which guide the film leader through the space therebetween to the film feeding path, and the pressure plate is mounted on the camera body movable toward and away from the film aperture between its operative position in which it supports the film leader opposed to the film aperture and its rest position in which it forms at least a part of the outer guiding member to provide a planar guiding surface facing toward the film aperture, a pressure plate pushing member being mounted on a back lid of the camera body to urge the pressure plate toward the operative position upon closure of the back lid and the engaging member being brought into engagement with the perforations of the film when the pressure plate is moved to the operative position; said outer guide member being in the form of a plate having therein a central opening and said pressure plate being supported in the central opening by means of a resilient arm integrally formed with the outer guide member, the pressure plate being adapted to return to the rest position in which its inner surface is flush with the inner surface of the outer guide member under the resilient force of the arm when the back lid is opened and the pressure of the pushing member is released.

4,457,608

INTERCHANGEABLE LENS WITH ELECTRICAL CONTACTS FOR TRANSMITTING DATA TO A CAMERA

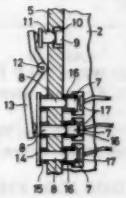
Shinzuke Komoto, and Yasuyuki Haneishi, both of Tokyo, Japan, assignors to Asahi Kogaki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1982, Ser. No. 375,599

Claims priority, application Japan, May 12, 1981, 56-68211[U]

Int. Cl.³ G03B *17/00*

U.S. Cl. 354—286 **2 Claims**



1. An assembly for mounting an interchangeable lens to a camera body comprising:

a lens mount;

a camera body mount;

a plurality of electrical contacts normally received within recesses provided in said lens mount;

a plurality of electrical contacts received within recesses provided in said camera body mount;

means for protruding said contacts from said lens mount when said lens is mounted to said camera body, said protruding means further comprising a lever means in said lens, one end of said lever means being engaged with ends of said lens contacts and the other end of said lever means having a protrusion;

a plate disposed between said lens contacts and said lever means; and

a plurality of springs biasing said lens contacts away from said camera body;

said lens mount including a lock groove into which said protrusion protrudes, said camera mount including a pin engageable with said protrusion, whereby said lever is

pivoted to urge said lens contacts out of said recesses to engage said camera body contacts.

4,457,609

DEVICE FOR COUPLING A LENS BARREL AND A CAMERA BODY

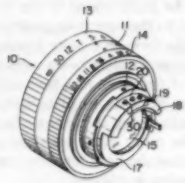
Naoki Tomino; Makoto Kimura, both of Tokyo; Kenichi Magariyama, Yokohama, and Yoshiharu Shiokama, Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 7, 1982, Ser. No. 433,222

Claims priority, application Japan, Oct. 13, 1981, 56-163079; Oct. 30, 1981, 56-172775; Oct. 30, 1981, 56-172777

Int. Cl.³ G02B *7/02*; G03B *17/12*

U.S. Cl. 354—286 **13 Claims**



8. A picture-taking lens barrel having around the optical axis an annular mount to be removably mounted to a camera body provided with an electrical device, said lens barrel comprising:

(a) a member including a cylindrical surface centered at said optical axis and fixedly formed with respect to said mount near said mount;

(b) electrical circuit means; and

(c) connector means connected to said circuit means and coupled to said electrical device during the mounting to said camera body, said connector means including movable contact means disposed on said cylindrical surface of said member and resiliently displaceable in the diametral direction of said cylinder.

4,457,610

CAMERA PAN HEAD WITH TILT TENSION CONTROL

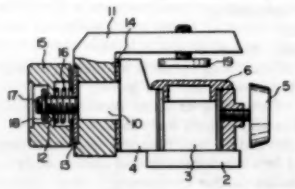
Michio Kawazoe, 30-11, 5-chome, Naritahigashi, Suginami-ku, Tokyo, Japan

Filed Mar. 26, 1982, Ser. No. 362,457

Claims priority, application Japan, Sep. 21, 1981, 56-140802[U]

Int. Cl.³ G03B *17/00*; F16M *11/12*

U.S. Cl. 354—293 **11 Claims**



1. A camera pan head comprising: a base plate fixed on a tripod; a swivel block mounted on said base plate; a post having an axis connected to said swivel block; a tiltable camea supporting plate rotatably supported on said post; an outward extending threaded shaft fixed to said post; a frictional plate set on said post for applying frictional force to said camera supporting plate and a compressed spring between an adjusting cap-nut threadably engaged with said threaded shaft, and said frictional plate for pressing said frictional plate against said supporting plate thereby providing positive camera tilt control.

4,457,611

PHOTOGRAPHIC SYSTEM FOR USE IN FLASH PHOTOGRAPHY WITH A CAMERA

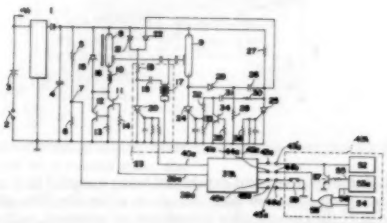
Tokuji Ishida, Daito, and Hiroshi Hosomizu, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 9, 1982, Ser. No. 416,128

Claims priority, application Japan, Sep. 11, 1981, 56-144308

Int. Cl.³ G03B *7/16*

U.S. Cl. 354—415 **38 Claims**



1. A photographic system for use in flash photography with a camera which contains an objective lens having a diaphragm, a shutter mechanism and a synchro switch for flash photography, comprising:

means for emitting, in advance of main flash light emission for flash photography, preliminary flash light having at least infrared light components and including a filter for substantially blocking light components other than said infrared light components to transmit substantially only said infrared light components;

means for emitting main flash light having at least visible light components;

means for receiving preliminary flash light reflected from an object to be photographed;

means for determining the aperture of said diaphragm in accordance with the light received by said receiving means;

means for starting light emission from said means for emitting preliminary flash light in response to starting of a shutter release operation of said camera; and

means for starting light emission from said means for emitting main flash light upon operation of said synchro switch.

4,457,612

LIQUID CRYSTAL DISPLAY DEVICE FOR CAMERA

Ryoichi Suzuki, Kanagawa; Hiroyasu Murakami, Tokyo; Masaharu Kawamura, Kanagawa; Shinji Sakai, Tokyo; Takashi Uchiyama, and Kikuo Momiyama, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 275,410, Jun. 19, 1981, abandoned, which is a continuation of Ser. No. 155,172, Jun. 2, 1980, Pat. No. 4,290,686. This application Jun. 1, 1983, Ser. No. 499,807

Claims priority, application Japan, Jun. 6, 1979, 54-70722

Int. Cl.³ G03B *17/20*; G09F *9/35*

U.S. Cl. 354—471 **1 Claim**

1. A liquid crystal display device for a camera comprising:

(a) a plurality of liquid crystal cells arranged in a line in a finder of a camera for displaying shutter time and warning that an object brightness is beyond an exposure control range of the camera;

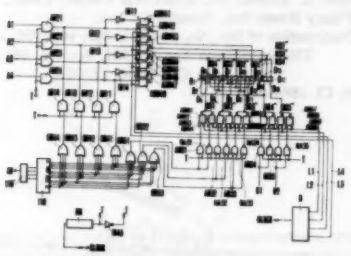
(b) a photometric circuit for generating a signal corresponding to the object brightness;

(c) an A/D converter for A/D converting the signal of the photometric circuit;

(d) photographic information generating means for generating a photographic information necessary for computing the shutter time from the A/D converted signal corresponding to the object brightness;

(e) computing means for computing the photographic information from the photographic information generating means and the signal from the A/D converter to compute the shutter time;

(f) a decoder for converting a signal from the computing means into a signal to be added to the liquid crystal cells;



(g) a pulse generator for generating a first pulse of amplitude V1 for driving the liquid crystal cells and a first reverse phase pulse having a phase reverse to the first pulse and a second pulse having an amplitude three times larger than the amplitude V1; and

(h) analog switch means to be driven to add the second pulse to any of the liquid crystal cells which is to be illuminated in correspondence to an output of the decoder and to add the first reverse phase pulse to any of the liquid crystal cells which is not to be illuminated.

4,457,613

MIXING DEVICE FOR BLENDING A DEVELOPER CONSISTING OF CARRIER PARTICLES AND TONER

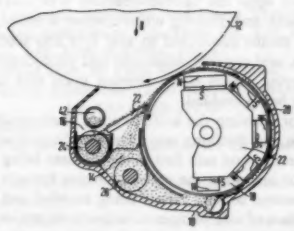
Walter Kopp, Taufkirchen, and Karl-Heinz Saalmueller, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 19, 1982, Ser. No. 369,832

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1981, 3117309

Int. Cl.³ G03G *15/08, 15/09*

U.S. Cl. 355—3 DD **6 Claims**



1. Apparatus for mixing carrier and toner particles of a developer mix in a developer station housing divided by a partition wall into a principal chamber, containing a main body of developer mix on housing floor and at least one rotatable developer drum for carrying developer mix into contact with a charge image carrier surface, and a mixing chamber, communicating at a first end through an opening in said partition wall with said principal chamber and receiving a supply of fresh toner particles through feed means in an opposed second end, comprising;

a first screw mounted for rotation in said principal chamber on the floor of said housing along the length of said developer drum for conducting developer mix from the first end of said mixing chamber toward the second end,

a second screw mounted for rotation in said mixing chamber for conducting fresh toner particles from the second end of said mixing chamber to the first end for passage into said principal chamber through said partition wall opening, and

a flow means disposed in said housing between said developer drum and said mixing chamber for conducting only that portion of the developer mix carried by said developer drum adjacent the mixing chamber second end into said mixing chamber second end for blending with the fresh toner particles, such that the major portion of the developer mix carried by said developer drum is spilled back directly into said principal chamber and said first screw serves to convey the spilled back mix progressively along the length of said developer drum for pick up by the developer drum adjacent the second end of said mixing chamber.

4,457,614

ELECTROSTATIC COPYING APPARATUS

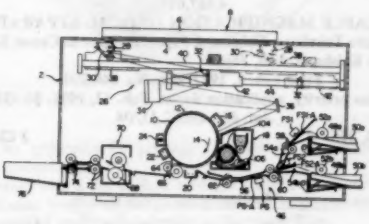
Tadanobu Nakajima, Sakurai; Masahide Iseki, Neyagawa, and Toshio Yoshiyama, Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Jul. 15, 1982, Ser. No. 398,538

Claims priority, application Japan, Jul. 21, 1981, 56-114276

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **13 Claims**



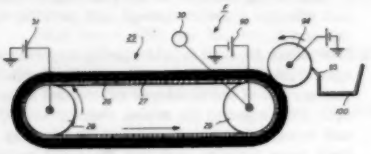
1. An electrostatic copying apparatus comprising a rotatable endless photosensitive member, means for rotating said rotatable photosensitive member, image-forming means for forming an image on the photosensitive member, means defining a predetermined passage for copying sheet to which an image is to be transferred, conveying means for conveying through the predetermined passage a copying sheet to which the image formed on the photosensitive member is to be transferred, cleaning means for cleaning the photosensitive member after transfer of the image thereon to the copying sheet conveyed through the predetermined passageway, said image-forming means being adapted in performing one copying cycle to complete the image formation before the photosensitive member has rotated through one turn from the starting of image formation, said means for rotating being adapted to keep the photosensitive member further in rotation after image transfer to the copying sheet for the purpose of cleaning, and means operative in performing a plurality of copying cycles successively for selectivley setting the starting point of image formation in a given copying cycle on the basis of the length in the conveying direction of the copying sheet conveyed through the passage during the previous copying cycle.

4,457,615

COMBINED CHARGE/CLEANING BRUSH FOR USE IN A XEROGRAPHIC COPIER

Donald A. Seanor, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1982, Ser. No. 437,996
Int. Cl.³ G03G 15/00
U.S. Cl. 355—3 CH 12 Claims



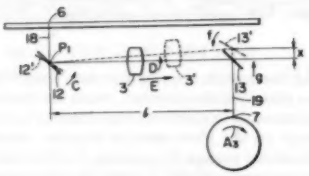
1. Xerographic copier apparatus comprising:
a photoconductive surface;
a brush supported for wiping contact with said surface and adapted to have different electrical biases applied simultaneously thereto;
means for electrically biasing said brush to at least a first voltage level for uniformly charging said surface to a voltage level sufficient for forming electrostatic images thereon;
means for exposing the uniformly charged surface to a light image to form a latent electrostatic image on said surface;
means for developing said latent electrostatic image with toner; and
means for simultaneously electrically biasing said brush to a second voltage level different from said first voltage level, said second voltage level being sufficient to attract residual toner particles from said photoconductive surface.

4,457,616

VARIABLE MAGNIFICATION OPTICAL APPARATUS

Mitsuhiro Tokuhara, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1982, Ser. No. 344,798
Claims priority, application Japan, Feb. 12, 1981, 56-19509
Int. Cl.³ G03G 15/04
U.S. Cl. 355—8 2 Claims



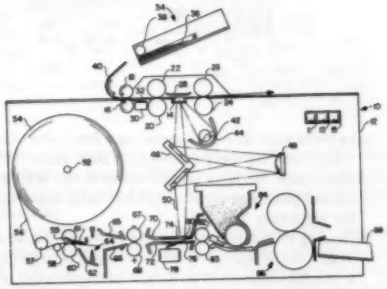
1. An optical apparatus for projecting an image in a first plane onto a second plane and provided with variable magnification means comprising:
an optical system for forming an image of the first plane on the second plane;
a first mirror disposed between the first plane and said image-forming optical system and rotatable, at a fixed position, by a determined angle θ upon a change of magnification;
a second mirror disposed between said image-forming optical system and the second plane and rotatable by the same rotation angle θ as said first mirror upon a change of magnification while at the same time translationally moving in a determined direction; and
wherein said image-forming optical system is rotated by an angle two times larger than the rotation angle θ of said first mirror and is also translationally moved along its optical axis when the magnification is changed.

4,457,617

ELECTROSTATIC COPIER HAVING A CONTROL SYSTEM FOR PREVENTING JAMS

Robert J. Tolmie, Jr., Brookfield Center, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 140,878, Apr. 14, 1980, abandoned.
This application Apr. 5, 1982, Ser. No. 365,426
Int. Cl.³ G03G 21/00
U.S. Cl. 355—13 2 Claims

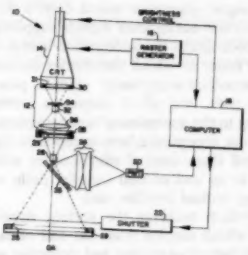


1. A control system for an electrostatic copier having a window, means for conveying a document over the window and along a first path, a second path along which a photoconductive web is conveyed to be imaged, developed and fused, means for conveying the photoconductive web along the second path, a knife located along the second path for receiving the photoconductive web and operative to cut the web upon being enabled, and means for supplying power to the copier, comprising:
first sensing means for sensing the presence of a document being conveyed along the first path, said first sensing means being enabled upon a document making contact therewith and disabled when such contact is ended,
second sensing means located on the second path downstream from said knife, said second sensing means being enabled upon the photoconductive web making contact therewith and disabled when contact is ended,
counter means connected to said first and second sensing means, said counter means and said photoconductive web conveying means being enabled upon said first sensing means being enabled,
means for enabling the knife to cut a photoconductive web therein and disabling said photoconductive web conveying means upon said first sensing means being disabled,
means for inhibiting the enabling means for said knife upon said second sensing means being enabled and continuing operation of said photoconductive web conveying means if said first sensing means is disabled prior to a first count of said counter means being attained,
means for enabling said knife and disabling said photoconductive web conveying means upon said first count being attained after said first sensing means has been disabled, and
means for disabling the power supply means if said counter means exceeds a second count, said second count being greater than said first count.

4,457,618
OPTICAL SYSTEM FOR USE IN ELECTRONIC ENLARGER

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 1, 1982, Ser. No. 394,294
Int. Cl.³ G03B 27/72
U.S. Cl. 355—20 6 Claims



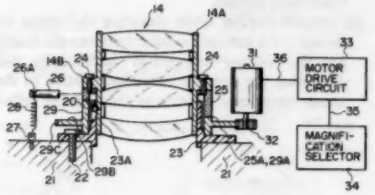
1. Apparatus for projecting an image of a transparency onto a sheet of photosensitive material, said apparatus comprising:
means for holding the transparency and the photosensitive material in separated planes;
a projection lens for forming an image of the transparency in the photosensitive material plane; and
means for illuminating the transparency such that the intensity of illumination over the transparency varies in a predetermined manner in accordance with the local density of the transparency to change the range of tones in the image projected by said projection lens onto the photosensitive material plane and such that fringe artifacts surrounding outline areas in the transparency are rendered visually unobjectionable in prints of the transparency, said illuminating means comprising:
(A) A flying spot scanner spaced away from said transparency plane by a predetermined distance; and
(B) optical means for imaging the flying spot of said flying spot scanner into a transparency and for altering the inherent energy distribution of said flying spot so that, as outline areas of the transparency are scanned, fringing areas surrounding outline areas of the transparency vary in a gradual manner thereby rendering fringing visually unobjectionable in prints of a transparency.

4,457,619
BACK FOCUS CONTROLLING DEVICE IN OPTICAL SYSTEMS

Toshikatsu Takahashi, Kanagawa, and Kazuo Yayama, Tokyo, both of Japan, assignors to Fuji Xerox Co., Ltd. and Tokyo Optical Co., Ltd., both of Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 362,946
Claims priority, application Japan, Apr. 30, 1981, 56-65489
Int. Cl.³ G03B 27/70
U.S. Cl. 355—60 10 Claims

1. A lens focus controlling device for an optical system, comprising,
a first cylindrical cam having a cam face formed on at least one end thereof;
a second cylindrical cam having a cam face on one end thereof slidably disposed in contact with said first cam face over a predetermined range;
lens means secured to said second cylindrical cam;
stop means operably engageable with said lens means to prevent rotation while allowing reciprocation of said lens means along the optical axis thereof; and
drive means for rotating said first cylindrical cam relative to said second cylindrical cam, said drive means comprising a stepping motor, electronic control means for controlling said stepping motor, and a circumferentially extending flange formed on an outer wall of one of said first and second cylindrical cams, said flange having a plurality of

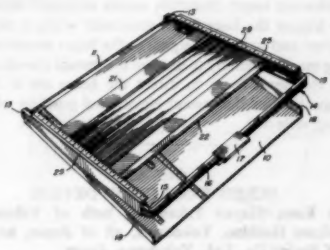


gear teeth formed on a periphery thereof engageable with a gear rotated by said stepping motor which rotates said at least one of said first and second cylindrical cams.

4,457,620
BORDER PRINTER FOR PHOTOGRAPHIC PRINTS

Edward Kostiner, 301 Murray St., Montreal, Quebec, Canada (H3C 2E1)

Filed Sep. 28, 1982, Ser. No. 425,851
Claims priority, application United Kingdom, Oct. 19, 1981, 8131476
Int. Cl.³ G03B 27/58
U.S. Cl. 355—74 6 Claims



1. An apparatus for printing a border on a photographic print comprising,
a panel with a flat surface having a paper stop at one edge,
a frame, hinged to the panel at the one edge, having two parallel arms perpendicular to the paper stop,
two sliding cross bars extending between the two parallel arms, the cross bars adapted to be maintained parallel with the paper stop at any position in the frame, each cross bar having a straight edge strip at one side to press the photographic print against the flat surface of the panel, and
an expandible lightproof concertina-type cover extending between the two sliding cross bars in the frame, the cover having lightproof edge connections with the two parallel arms when the cross bars are at any position in the frame.

4,457,621
RANGEFINDER

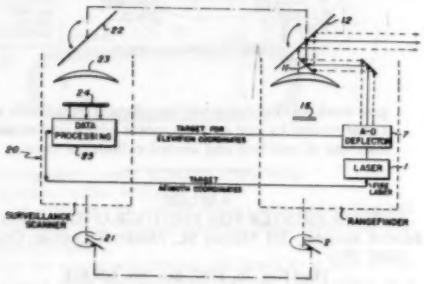
Jeffery J. Harris, and David I. Greenwood, both of Bristol, England, assignors to British Aerospace, Weybridge, England

Continuation-in-part of Ser. No. 915,123, Jun. 13, 1978, abandoned. This application Apr. 16, 1980, Ser. No. 140,780
Claims priority, application United Kingdom, Jun. 17, 1977, 25543/77
Int. Cl.³ G01C 3/08; G01B 11/26
U.S. Cl. 356—5 31 Claims

1. A laser rangefinder arrangement for determining range to a target comprising, in combination:
(a) a nodding reflector,

(b) a laser beam generator arranged to direct its beam onto the nodding reflector, the nodding reflector being arranged automatically to rotate and to nod repetitively in elevation whereby to produce an azimuth-elevational beam scan pattern,

(c) non-mechanical beam elevation deflection means positioned in the path of the beam between the beam generator and the nodding reflector for additionally and instantly deflecting the beam in elevation relative to the instantaneous elevational position of the nodding reflector,



(d) a beam receiver so positioned as to receive via the nodding reflector any beam reflected back from a target picked up by the outgoing beam the received beam indicating the range to the target, and

(e) infra-red target detection means arranged automatically to trigger the laser beam generator when a target is detected and to apply a signal to the beam elevation deflecting means whereby to change the instant elevational angle of the beam so as to direct the beam on to the target regardless of the instant elevational position of the nodding reflector.

4,457,622

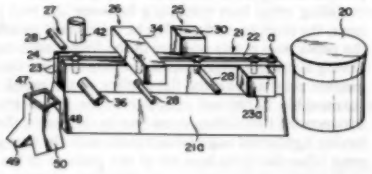
SCREW INSPECTION DEVICE

Michio Kato; Hayao Takahashi, both of Yokosuka, and Hidekazu Hoshino, Yokohama, all of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Jan. 27, 1982, Ser. No. 343,351

Int. Cl.³ G01N *21/88*

U.S. Cl. 356—237 **7 Claims**



1. A screw inspection device comprising:

a parts feeder which supplies a screw;

transfer means for sequentially transferring the screw which is fed from said parts feeder along a predetermined transfer path while the screw is maintained in a predetermined posture;

a plurality of sensors disposed along said transfer path, each performing a predetermined measurement for the screw which has been transferred to said transfer path and output a measurement signal which indicates measured results;

a plurality of timing signal transmitters each of which outputs a predetermined timing signal every time a screw reaches said sensors;

a comparator which is disposed for each of said sensors, in which a predetermined tolerance is set and which receives the measurement signal and the timing signal, said comparator comparing the measurement signal and the tolerance in response to the timing signal so that a predetermined acceptance/non-acceptance signal is output from said comparator when the measurement signal is within or outside the tolerance;

a sorting signal generator which counts the number of acceptance/non-acceptance signals supplied from said sensors, which stores the acceptance/non-acceptance signals and the order in which the screws corresponding to the acceptance/non-acceptance signals pass through said transfer path, and which outputs a sorting signal corresponding to the acceptance/non-acceptance signal when a sum of the acceptance/non-acceptance signals which are generated from one of said sensors which is disposed closest to an end of said transfer path; reaches a corresponding ordinal number; and

a sorter which receives the sorting signal and sorts the screws which are fed from the end of said transfer path into non-defective screws and defective screws.

4,457,623

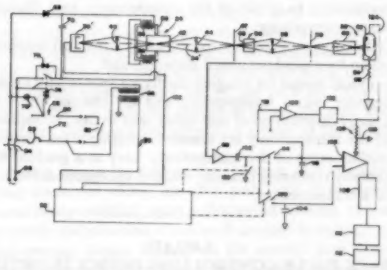
ATOMIC ABSORPTION SPECTROPHOTOMETER PROVIDING BACKGROUND CORRECTION USING THE ZEEMAN EFFECT

Walter Bohler, Wilton, and Thomas W. Barnard, Weston, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 23, 1981, Ser. No. 237,199

Int. Cl.³ G01J *3/42*

U.S. Cl. 356—307 **31 Claims**



1. In an atomic absorption spectrophotometer employing an electromagnetic optical effect for background correction and comprising an electromagnetic field producing device for producing the effect having a pair of input terminals; the improvement comprising: connecting the electromagnetic field producing device to a source of substantially single frequency alternating current; and a unidirectional conducting device connected in circuit with said electromagnetic field producing device to produce a substantially unidirectional field.

4,457,624

SUSPENDED SEDIMENT SENSOR

Marvin C. Goldberg, Englewood, and Kirk M. Cunningham, Lakewood, both of Colo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 10, 1982, Ser. No. 376,851

Int. Cl.³ G01N *15/02*

U.S. Cl. 356—336 **4 Claims**

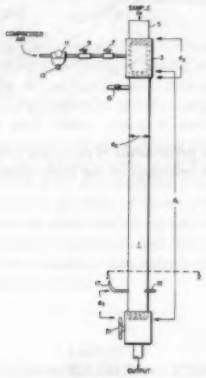
1. A suspended sediment sensor system for measuring particle size distribution in a fluid sample in the range of 50 to 1000

microns and particles concentration from 50 to 50,000 parts per million comprising:

a generally vertical hollow interior fall tube adapted to receive within its hollow portion the fluid sample whose particle size distribution and concentration content is to be measured;

said fall tube having port means near its lower end for admitting laser light thereinto and for detecting the scattered admitted laser light after it impinges upon the particulate matter in the sample;

a source of laser light operatively associated with said port means, said source admitting a collimated generally vertical polarized light beam into the interior of the fall tube in



a direction generally perpendicular to the direction particles would fall in the tube;

means mounted in the fall tube for trapping light transmitted across its interior; and

a light intensity detector system operatively associated with said fall tube's port means for measuring the intensity of back scattered light from the particles in the sample after being impinged by the laser light beam and outputting electrical signals related thereto, said detector system having a light polarizer operative in the same direction as the impinging polarized lser light and said system being mounted on the fall tube adjacent to the laser source and oriented with respect to the admitted laser beam such that it forms an obtuse angle therewith.

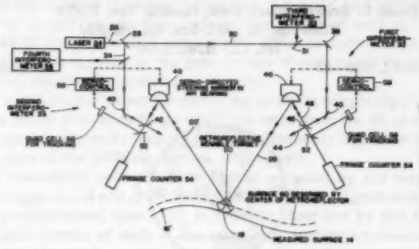
4,457,625

SELF CALIBRATING CONTOUR MEASURING SYSTEM USING FRINGE COUNTING INTERFEROMETERS

Allen H. Greenleaf, and John T. Watson, both of Lexington, Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Jul. 13, 1981, Ser. No. 282,552
Int. Cl.³ G01B 9/02
U.S. Cl. 356—360 **6 Claims**

2. A system for measuring the contour of a three dimensional surface, comprising an arrangement of at least four distance measuring systems positioned in a polyhedral configuration above a surface to be measured, with each measuring system providing distance measurements to a measuring point proximate the surface as the measuring point is moved across the contour of the surface, to provide a sufficient quantity of measurement data to define the system geometry and the contour of three dimensional surface, each distance measuring system including a differential distance measuring system utilizing an interferometer and each interferometer having a beam steering head for directing an interferometer beam at the measured



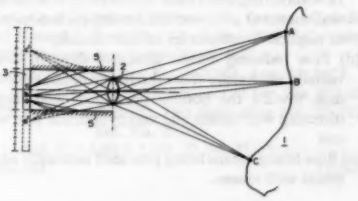
point during movements thereof across the contour of the surface.

4,457,626

APPARATUS FOR DETERMINING THE POSITION OF A MARK ON AN OBJECT

Masanori Idesawa, Wako, and Toyohiko Yatagai, Tokyo, both of Japan, assignors to Rikagaku Kenkyusho, Wako, Japan

Filed May 20, 1981, Ser. No. 265,576
Claims priority, application Japan, May 28, 1980, 55-71044
Int. Cl.³ G01B 11/24
U.S. Cl. 356—376 **9 Claims**



1. An apparatus for determining the position of at least one mark on an object which is to be determined in terms of configuration, movement or any other geometrical or physical condition comprising:

a photo-sensitive element;

a light reflecting body located in the vicinity of said photo-sensitive element in such a position that a beam of light emanating from a mark directly towards said photo-sensitive element is allowed to fall on the photo-sensitive area of said element and a beam of light emanating from said mark when displaced or emanating from a different mark on said object directly towards an orthogonal coordinate domain around said photo-sensitive area is reflected at least once before being directed to said photo-sensitive area; and

means for determining the coordinates x and y of the mark on the object from the coordinates x_d and y_d of the detected position of the beam on the photosensitive element, the location w_x and w_y of the light-reflecting body, and the number of reflections n_x and n_y of the beam by the light-reflecting body in accordance with the equations:

$$x=2n_xw_x+(-1)^{|n_x|}\cdot x_d$$

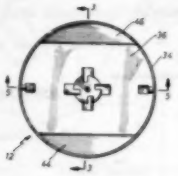
and,

$$y=2n_yw_y+(-1)^{|n_y|}\cdot y_d.$$

4,457,627
CIRCULAR CONTAINMENT SYSTEM FOR WELL DRILLING FLUID

Robert E. Kirby, 427 Avenue A, LaMarque, Tex. 77568, and Jacob L. Brewer, Black Jack, Hardin, Tex. 77575

Filed Apr. 5, 1982, Ser. No. 365,522
Int. Cl.[1] B28C 5/08
U.S. Cl. 366—65 10 Claims



1. Containment and circulating tank means for receiving drilling fluid from a well during well drilling operation and from which said drilling fluid is withdrawn and injected into the well, said tank means comprising:

(a) generally horizontal bottom wall means of substantially planar configuration;

(b) generally cylindrical side wall means secured in substantially normal relation to said bottom wall means;

(c) a pair of inclined flow directing walls being secured to said bottom wall means and said side wall means, said flow directing walls being of generally planar configuration and intersecting said bottom wall means at chords of a circle defined by said cylindrical side wall means, said flow directing walls each intersecting said cylindrical side wall means at a curved line having each extremity thereof at respective extremities of said chords;

(d) flow inducing means directing flow of drilling fluid radially outwardly from the lower central portion of said tank toward the bottom portion of said inclined flow directing wall means and said cylindrical side wall means; and

(e) flow lifting means being provided internally of said cylindrical wall means.

4,457,628
STIRRING APPARATUS

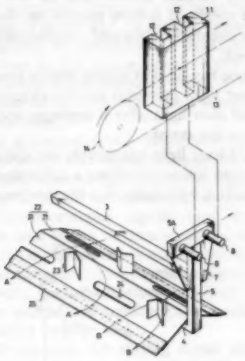
Takao Kataishi, and Nobufumi Yokoi, both of Tokyo, Japan, assignors to Misawa Home Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1981, Ser. No. 325,898
Claims priority, application Japan, Jul. 23, 1981, 56-115681
Int. Cl.[3] B28C 5/12
U.S. Cl. 366—67 11 Claims

8. A stirring apparatus adapted for stirring mortar, comprising:

a movable support frame including a pair of vertical supports; and

an elongated stirring blade which is suspended from said vertical supports, said stirring blade comprising a pair of elongated rectangular plate members having a common longitudinal edge and defining an obtuse angle between the lower surfaces thereof, such that said blade has a downwardly opening V-shape, both of said plate members having a longitudinally extending series of alternating openings and projections formed thereon, said openings extending through the associated plate member, and said projections extending upwardly from the upper sides of the associated plate member, both of said series being parallel with and longitudinally offset from each other

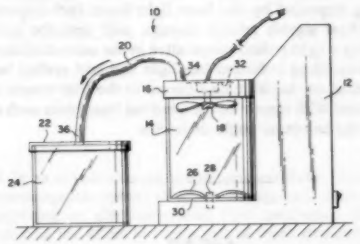


such that the projections of one plate member are laterally aligned with openings of the other plate member.

4,457,629
GLUTEN MAKER FOR THE HOME

Soonchin Liaw, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Aug. 26, 1983, Ser. No. 526,784
Int. Cl.[3] B01F 13/06
U.S. Cl. 366—139 5 Claims



1. Apparatus for making gluten flour using an electric dough maker which comprises:

(a) a mixer container having rotatable blades and a shaft through a bottom portion, so that the blades can agitate the flour, the mixer container removably affixed to and operated by the dough maker;

(b) a first lid placed on the mixer container;

(c) means for sucking up starch particles when the flour is agitated;

(d) a flexible outlet pipe having one end affixed to the first lid to allow for exit of the starch particles;

(e) a second lid affixed to other end of the flexible outlet pipe; and

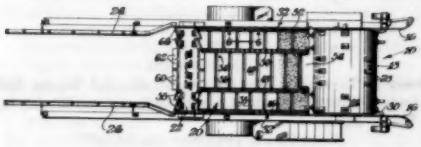
(f) a container having the second lid placed on it to trap the starch particles while leaving the gluten flour in the mixer container to be prepared as dough.

4,457,630

COMPOST PROCESSING MACHINE

Robert T. Pannell, Kennett Square, Pa., assignor to Pannell Manufacturing Corp., Avondale, Pa.

Filed Jun. 25, 1981, Ser. No. 277,270
Int. Cl.³ B01F 15/02
U.S. Cl. 366—345 45 Claims



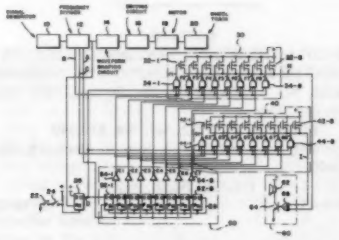
20. A compost processing machine for separating, mixing and stacking compost, said machine having a front end and a back end and being movably mounted, pick-up means at said front end for picking up compost and discharging the compost toward said back end, beater means at said back end, said beater means being capable of cross-mixing the compost fed to said beater means, said beater means comprising a horizontal rotatable drum mounted for receiving the compost discharged by said pick-up means, a plurality of diverter plates secured to said drum, said diverter plates including sets of diverter plates on the central portion of said drum, and sets of diverter plates at each side portion of said drum intermediate said sets of central portion diverter plates.

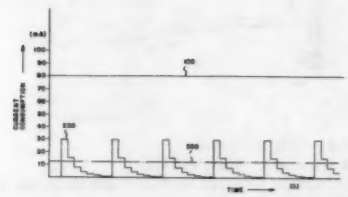
4,457,631

ATTENUATION-MODULATION CIRCUIT FOR GENERATING ELECTRONIC BELL SOUNDS FOR A TIMEPIECE

Katsuhiko Takebe, Tokyo, Japan, assignor to Rhythm Watch Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1982, Ser. No. 437,265
Claims priority, application Japan, Oct. 29, 1981, 56-173407
Int. Cl.³ G04B 21/00
U.S. Cl. 368—273 5 Claims





1. An electronic bell sound generating circuit for a timepiece comprising:

an audio frequency signal generating circuit for generating a plurality of audio frequency signals;

at least two attenuation-modulation circuits comprising a plurality of MOS transistors connected in parallel and a plurality of gate circuits each connected to a gate of each of the MOS transistors with respectively different audio frequencies each supplied to the gate circuits of each of the respective attenuation-modulation circuits;

an alarm trigger circuit for providing an alarm trigger signal at a preset time in order to effect the open state for all of the gate circuits and to supply the audio frequency signals to the gates of the MOS transistors, respectively;

an attenuation control circuit that is actuated by the alarm trigger signal and provides attenuation control signals with a predetermined time cycle in order to close one by one the gate circuits of each of the respective attenuation-modulation circuits at every specified time interval, thereby causing the MOS transistors connected to the outputs of those gate circuits to turn off; and

a sound generating circuit that is connected in a form of an open drain connection to the MOS transistors provided in the attenuation-modulation circuits to generate sounds by superposing the output signals from the respective at least two attenuation-modulation circuits;

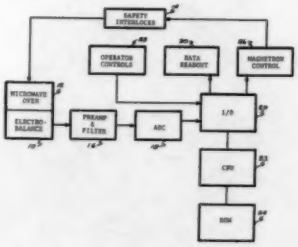
whereby the combined on-operation resistance of the MOS transistors connected in parallel are increased stepwisely with the specified time cycle to effect a stepwise decrease in the value of current of the plurality of audio signals with different audio frequencies inputted in superposition to the sound generator to obtain the simulated bell sound.

4,457,632

AUTOMATIC VOLATILITY COMPUTER

Michael J. Collins, Matthews; Bernard W. Cruse, Jr., Indian Trail, and Ronald J. Goetchius, Charlotte, all of N.C., assignors to CEM Corporation, Indian Trail, N.C.

Continuation-in-part of Ser. No. 603,354, Aug. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 381,087, Jul. 20, 1973, Pat. No. 3,909,598. This application Apr. 13, 1979, Ser. No. 29,882
Int. Cl.³ G01N 5/04, 22/04, 25/56
U.S. Cl. 374—14 3 Claims

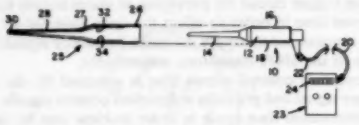


1. An apparatus for measuring the volatile content of substances comprising electronic weighing means, microwave heating means, radiation isolator means, data acquisition and apparatus control means and information readout means, said electronic weighing means being positioned within said microwave heating means to electronically sense weights, said apparatus control means being electrically connected to and preset to sequentially actuate said weighing means and microwave heating means and said radiation isolator means being positioned to absorb excess microwave radiation, said data acquisition and apparatus control means providing an electrical output signal representative of weights being sensed, said electrical output signal being electrically connected to said information readout means.

4,457,633
TEMPERATURE PROBE COVER

Harry J. Andrews, Marblehead, Mass., assignor to Kidde, Inc., Saddle Brook, N.J.

Filed Mar. 26, 1982, Ser. No. 362,102
Int. Cl.³ H01R 11/00; G01K 1/08
U.S. Cl. 374—209 4 Claims



1. An instrument for measuring the temperature of a body and comprising:

a probe;

probe connector means retained by said probe and adapted for connection to a temperature read-out means, said probe connector means comprising a plurality of electrical conductors on said probe;

a cover sheath adapted to be friction fitted over said probe;

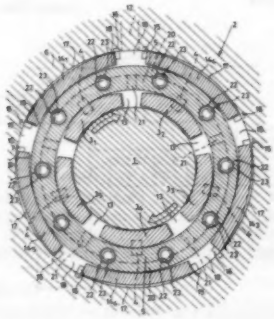
a temperature sensor means mounted at an end of said cover sheath and extending to an outside surface thereof; and

sheath connector means comprising a plurality of electrical conductors in said cover sheath and electrically coupled to said sensor means, said electrical conductors in said cover sheath being shaped and arranged to interconnect with said electrical conductors on said probe with said cover sheath fitted over said probe.

4,457,634
PIVOTED SEGMENTAL BEARING

Costantino Vinciguerra, Florence, Italy, assignor to Nuovo Pignone S.p.A., Florence, Italy

Filed Jun. 21, 1982, Ser. No. 390,685
Claims priority, application Italy, Jul. 7, 1981, 22776 A/81
Int. Cl.³ F16C 17/00, 27/02, 17/26
U.S. Cl. 384—302 3 Claims

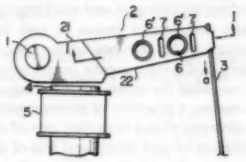


1. A pivoted segmental bearing, having a series of shoes of rigid antifriction material in a chamber wherein the shoes are pivotally mounted angularly equidistant on the inner surface of a shoe support member disposed about the shaft to be supported and contained in an outer support casing, and opposing walls which are provided with seal gaskets for lubricating oil which fills and places the chamber in which said shoes are disposed under pressure, characterised in that between the outer surface of said annular shoe support member and the overlying inner surface of said outer support casing there is disposed a series of leaf springs held angularly equidistant in position by lateral positioning pins supported by said outer support casing, the annular chamber in which said leaf springs are disposed also being filled by the lubricating oil, and means provided for resiliently pressing said annular shoe support member axially against one of said walls of the outer support casing, including a series of helical springs which are inserted into a corresponding series of axial cavities provided angularly equidistant on the circumference of said annular shoe support member, and which cooperate with the other of said walls of the outer support casing.

4,457,635
PRINTER ARM

Kenichiro Takezawa, Seto; Mineo Harada, and Yutaka Kako, both of Owariasahi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 4, 1982, Ser. No. 345,677
Claims priority, application Japan, Jun. 10, 1981, 56-89016
Int. Cl.³ B41J 3/12
U.S. Cl. 400—124 10 Claims



1. A printer arm for transmitting an impact to a wire stylus in a wire matrix print head comprising:

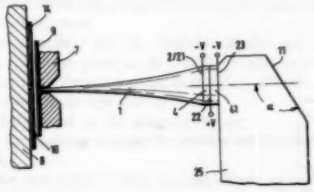
a wire stylus having a predetermined length; and

a lever to one end of which said wire stylus is fixed at a portion thereof, said lever being a hollow member of a polygonal cross-section and having side walls substantially parallel to a longitudinal axis of said wire stylus, each of said side walls of said lever is provided with at least one through hole, a portion of said side wall around said hole is provided with a convexity, said lever is made from a thin sheet material, and the portion around said hole has a thickness greater than a thickness of other portions of said side wall.

4,457,636
METHOD OF ACTUATING PRINTING ELEMENTS AND APPARATUS FOR PERFORMING THE METHOD

Alban Nusser, No. 4, Michael-Wening-Strasse, 8050 Freising, Fed. Rep. of Germany

Filed Sep. 17, 1982, Ser. No. 419,340
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1981, 3137690
Int. Cl.³ B41J 3/12
U.S. Cl. 400—124 13 Claims



1. A matrix printer comprising

(a) means defining a support surface;

(b) a record carrier arranged for movement along said support surface;

(c) an ink carrier adjacent the surface of said record carrier opposite said support surface means;

(d) a plurality of printing elements, each in the form of a horn-shaped, tapered, hyperbolic tube configuration with a narrow free end and a wide end, said printing element being arranged with said narrow free end, in its normal position, adjacent the surface of said ink carrier opposite said record carrier;

(e) guide means for guiding said narrow free end of each of said printing elements;

(f) at least one piezoelectric drive element abutting said wide end of each of said printing elements, said at least one piezoelectric drive element including a positive electrode and negative electrode thereon; and

(g) support means for supporting said at least one piezoelectric drive element abutting said wide end of each os said printing elements;

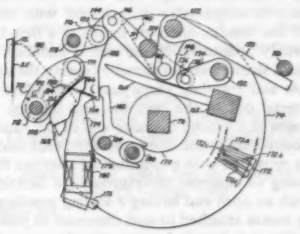
(h) whereby upon application of an electrical pulse to said electrodes of said at least on piezoelectric drive element of each of said printing elements, a shock wave travels along said printing element and said narrow free end of said printing element is caused to be deflected towards said record carrier to directly make an impression through said ink carrier on said record carrier and to be returned to its normal position.

4,457,637

SQUEEZE PRINTING MECHANISM

Frederick P. Willcox, 565 Oenoke Ridge, New Canaan, Conn. 06840

Filed Sep. 24, 1982, Ser. No. 422,923
Int. Cl.³ B41J *1/02, 9/28*
U.S. Cl. 400—172 **7 Claims**



1. In a printer of the type having a frame,

a platen retained by the frame for supporting record material to receive a line of imprints,

a print carriage supported by the frame and positionable along a path parallel to the platen by means supported on the frame,

a font storage device supported by the print carriage and having a plurality of individually selectable character-bearing type chips accessibly stored therein,

a transfer station,

means on the print carriage for removing a selected type chip from the storage device at said transfer station and then returning the type chip to the storage device after a printing operation, and

a printing mechanism on said print carriage for making imprints from serially selected type chips, comprising:

(a) an imprinting member having (i) a print end with a transverse face thereon for supporting and retaining a type chip transferred thereto, and (ii) a control end spaced apart from the print end; said member being movable from said transfer station to an imprinting position and back to the transfer station,

(b) a primary crank having a crankpin at an end thereof which supports said imprinting member adjacent said print end for limited rotation thereabout, said primary crank being rotatable through an angle generally less than 45°,

(c) a control crank, shorter than said primary crank; having a crankpin at the end thereof for rotatably supporting said control end of said imprinting member, said control crank being rotatable to control the angular position of said imprinting member about said primary crankpin,

(d) a toggle crank having a crankpin at the end thereof and rotatable through an angle generally less than 45°,

(e) a toggle link connecting the respective crankpins on said control crank and said toggle crank, said toggle link and said toggle crank being arranged to squeeze a type chip against said record material when said imprinting member is in imprinting position,

(f) a primary electromagnetic actuator having associated means for driving said primary crank to move said imprinting member from said transfer station to said imprinting position, and

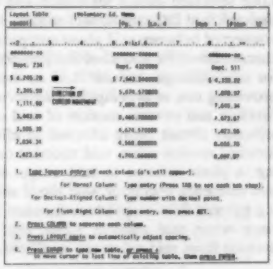
(g) a bi-directional electromagnetic actuator connected to drive said toggle crank in a first direction to aid in moving said imprinting member toward said imprinting position, effect said squeeze, and then apply force in an opposite direction to effect return of the imprinting member to said transfer station.

4,457,638

AUTOMATIC CENTERING OF TEXT COLUMN ENTRIES

Gary R. Horn, and Kenneth O. Shipp, Jr., both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 24, 1981, Ser. No. 305,251
Int. Cl.³ B41J *25/18*
U.S. Cl. 400—279 **3 Claims**



1. A method for automatic centering of a column segment during a multiple text column table layout mode on an interactive word processing system formed from a keyboard, display, memory for storing formatted information, and an intercoupling microprocessor comprising the steps of:

operator keying in of a column width example of repeated text and control characters; and

responsive to the stroking of a dedicated function key, the machine implementable step of determining the midpoint in the example and inserting of a center tab stop at the midpoint position.

4,457,639

MOTOR CONTROL FOR PRINTER CARRIAGE

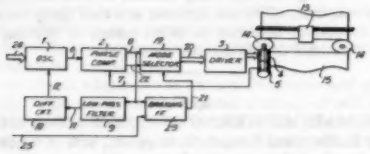
Akio Nagai, Shiojiri, Japan, assignor to Epson Corporation, Nagono, Japan

Filed Sep. 30, 1982, Ser. No. 430,424
Claims priority, application Japan, Oct. 7, 1981, 56-159898
Int. Cl.³ B41J *19/30*; G05B *1/02*
U.S. Cl. 400—322 **6 Claims**

1. A control for the carriage of a serial printer using a DC motor, comprising:

a driver for driving said DC motor;

a phase-locked loop speed control circuit including:
an encoder detecting rotative speed of said DC motor;
a reference frequency modulatable oscillator outputting reference speed pulses;
a phase comparator for detecting the differences between phases of an output signal from said encoder and an output signal derived from said reference oscillator, said comparator outputting a phase-difference signal, and
a switching circuit for switching voltage to be applied to said DC motor in response to an output signal from said phase comparator;
a feedback circuit including:
a low-pass filter converting said phase-difference signal from said phase comparator into an analog speed signal;
a differentiating circuit converting said analog speed signal from said low-pass filter into a quasi-acceleration signal, said quasi-acceleration signal being input to said reference oscillator, said feedback circuit effecting



frequency modulation of the output signal from said reference oscillator with said quasi-acceleration signal from said differentiating circuit, said modulation operation bringing said encoder and reference signals in phase;
a mode selection circuit for controlling the flow of current through said DC motor, said mode selection circuit being connected between said phase comparator and said driver, current flow in a first direction providing forward motion for said carriage, current flow in the opposite direction providing one of braking for said forward motion of said carriage and reverse motion of said carriage, said mode selection circuit being adopted to effect braking of said forward motion when said encoder output signal is leading in phase relative to said output signal derived from said reference oscillator, said mode selection circuit causing current flow to produce forward motion of said carriage when said encoder signal lags said output signal derived from said reference oscillator.

4,457,640

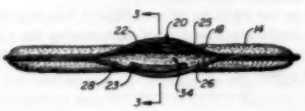
BODY WASH PAD FOR BATHING

Janice L. Anderson, 2302 13th Ave., Oakland, Calif. 94606

Filed May 27, 1982, Ser. No. 382,467

Int. Cl.³ A47K *7/03*; A46B *5/04*

U.S. Cl. 401—7 **6 Claims**



1. A wash pad having a pocket for receiving a cleanser comprising:
a core formed of a cleanser absorbant sponge material;
a casing covering said core, said casing having on one side a cloth cover piece and on the other side a liner piece of water porous material, said cover piece and liner piece being joined by stitching around their coupled edge;
a pocket constructed of an outer cloth pocket piece coupled to said casing over said liner piece by stitching around a substantial portion of the coupled edge leaving an opening for receiving a cleanser; and
a porous webbing material having a characteristic of aiding in intersurface shear slippage, said webbing material being disposed between said pocket piece and said casing liner and contiguous therewith for rapid foaming of the cleanser when said wash pad is rubbed or squeezed.

4,457,641

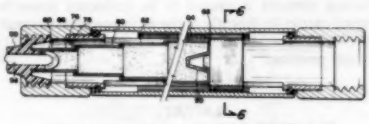
MATERIAL DISPENSER APPARATUS

Donald R. Smith, 1601 W. Knoxville, Broken Arrow, Okla. 74012

Division of Ser. No. 253,178, Apr. 13, 1981, Pat. No. 4,388,011, and a continuation-in-part of Ser. No. 77,342, Sep. 20, 1979, Pat. No. 4,277,194. This application Dec. 27, 1982, Ser. No. 453,778

Int. Cl.³ A46B *11/02*

U.S. Cl. 401—135 **3 Claims**



1. A material dispenser apparatus comprising an elongated cylindrical hollow handle, a central portion thereof being internally threaded, an elongated rotatable sleeve member rotatably disposed within the handle for carrying material to be dispensed, a pair of oppositely disposed longitudinal slots provided in said sleeve member, a dispenser drive member transversely disposed through said slots and having outer threaded ends in cooperative engagement with the internal threading of the handle, operator means at a first end of the handle operably connected to the sleeve member to impart rotation to said sleeve member thereby causing the drive member to rotate and translate along said longitudinal slots for forcing material out of the opposite end thereof, a second operator means at a second opposite end of the handle which is operably connected to the sleeve member, each said operator means being provided with a longitudinal aperture for permitting dispensing of material therethrough, a cartridge being provided with an open end having a sealing membrane across the opening means attached to said dispenser to puncture said membrane after it is installed within the sleeve, and wherein the cartridge is of a telescopic construction comprising a plurality of axially aligned sleeve members movable between a relatively extended position and a mutually interfitting collapsed position.

4,457,642

APPARATUS FOR APPLYING LIQUID TO A SURFACE HAVING SAFETY VENT

John D. Braithwaite; Derrick O. King, both of Berkshire; Sidney J. Williams, Surrey, and James Prior, Berkshire, all of England, assignors to Black & Decker Inc., Newark, Del. and Berger, Jensen and Nicholson Limited, London, England

Filed Oct. 8, 1981, Ser. No. 309,697

Claims priority, application United Kingdom, Oct. 8, 1980, 8032485

Int. Cl.³ B05C *17/00, 21/00*

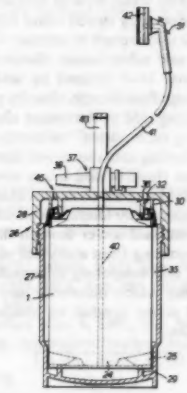
U.S. Cl. 401—188 R **17 Claims**

1. An apparatus for applying liquid to a surface, comprising:
an outer vessel;
an inner liquid container housed within the outer vessel;
a seal engaged between the outer vessel and the inner container and defining first and second chambers in said vessel between said vessel and said container, said seal preventing communication between said first and second chambers;
means, carried by said vessel and located in the interior thereof, for supporting said seal and allowing movement

of said seal relative thereto, such movement enabling communication between said first and second chambers;

means for pressurizing said first chamber and the interior of said container for dispensing liquid from said container; and

means, communicating with said second chamber, for venting said second chamber to atmosphere;



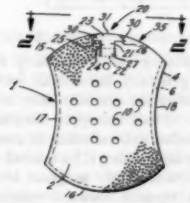
whereby malfunctioning of said pressurizing means leading to an excess pressure in said first chamber causes said seal to move relatively to said seal supporting means to place said first and second chambers in communication so enabling venting to atmosphere of said first chamber through said second chamber and said venting means.

4,457,643

SPONGE FOR CONTAINING SOAP

Joseph E. Caniglia, 5368 E. 134th St., Garfield Heights, Ohio 44125

Filed May 21, 1982, Ser. No. 380,822
Int. Cl.³ A47K 7/02
U.S. Cl. 401—201 **11 Claims**



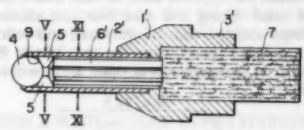
1. A washing device, comprising container means for forming an envelope for soap-like material, said container means comprising two substantially parallel walls of porous resilient material forming therebetween an interior area to contain such soap-like material, and discrete opening means through said walls of said container means for permitting lather to exit said container means, entrance means at an end of said container means for permitting insertion and removal of such soap-like material with respect to said interior area, and tab-like locking means integral with said container means for locking soap-like material therein, said tab-like locking means comprising a tab cut directly from the material of which one of said parallel walls of said container means is formed and a lock opening cut through the material of which the other of said parallel walls of said container means is formed and aligned with respect to said tab-like locking means to pass the latter therethrough to secure said tab-like locking means therein, said tab-like locking means having a relatively narrow stem portion and a relatively enlarged head portion, said head portion being resiliently deformable to pass through said lock opening and thereafter expandable to a size larger than said lock opening thereby to lock said tab with respect to said lock opening, said stem portion supporting said head portion with respect to said one of said parallel walls, said container means having a perimeter edge portion of a first pair of generally parallel edges and a second pair of generally parallel edges, said first pair of edges being generally orthogonal to the second pair of generally parallel edges, said entrance means being in one of said edges for permitting soap-like material to be inserted or removed with respect to said interior area, said pair of substantially parallel edges that are generally orthogonal to said one edge being curvilinearly concave with respect to the approximate center of said container means to provide a tapered cross-section to facilitate manual grasping of the device, said tab being cut directly from one of said two substantially parallel walls proximate said one edge, and said lock opening being cut out from the other of said two substantially parallel walls proximate said one edge.

4,457,644

BALL-POINT PEN TIP

Takehiko Yokosuka, Aichi, Japan, assignor to Pilot Ink Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 109,375, Jan. 3, 1980, abandoned. This application Dec. 17, 1981, Ser. No. 331,743
Int. Cl.³ B43K 7/10
U.S. Cl. 401—216 **11 Claims**

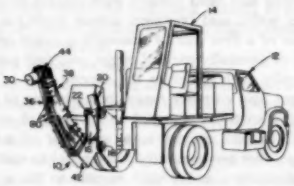


1. A ball-point pen using low viscosity aqueous ink, comprising; a metallic tubular ink guide portion formed with a plurality of radially inwardly extended projections to provide a ball seat and to define ink capillary passages therebetween, a metallic ball having a diameter of 0.5–1.5 mm rotatably secured between said ball seat and tip end of said ink guide portion, a holder having both ends formed with openings and an ink feeder, said ink guide portion being formed of stainless steel having its rear end inserted into one open end of said holder, said ink feeder comprising an ink guide stem formed of plastic rod and, an ink supply stem formed in a rod shape having a larger diameter that that of said ink guide stem and being formed of fascicular fibers partially bonded together with resin, one end of said ink supply stem inserted into the other end of said holder, said ink guide stem disposed in and projecting through said ink guide portion to provide capillary channels defined between said ink guide stem and an inner surface of said ink guide portion, said ink guide stem having one end in contact with said projections but spaced from said ball and the other end in contact with said end of said ink supply stem in said holder to supply low viscosity aqueous ink from said ink supply stem to said ball through said capillary passages.

4,457,645
APPARATUS FOR BREAKING PAVEMENT

Stephen Klochko, Grosse Isle, Mich., assignor to Wolverine Technology, Inc., Southfield, Mich.

Filed Apr. 21, 1983, Ser. No. 487,332
Int. Cl.³ E01C 23/12
U.S. Cl. 404—90 7 Claims



1. An apparatus suitable for breaking pavement, said apparatus comprising:

(a) at least one spring pack connected between a housing and an impact tool holder, said impact tool holder having an impact tool connected thereto, said housing connected to one end of a vehicle for pivotal movement about a transverse horizontal axis;

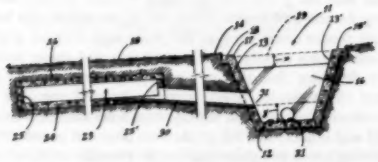
(b) a hydraulic cylinder connected to said housing for rotating said housing and thereby lifting and lowering said spring pack and tool holder, and said housing connected to said vehicle for movement about a vertical axis thereby permitting lateral swinging movement of said spring pack and tool holder;

(c) said spring pack including a plurality of stacked leaf springs with a centrally located main leaf spring extending full length between said housing and said tool holder, a first group of leaf springs having variable lengths being stacked together on one side of said main spring and a second group of leaf springs having variable lengths being stacked together on the other side of said main spring, said spring pack further including third and fourth groups of leaf springs positioned on opposite sides of said main spring between said main spring and said first and second groups of springs, and fifth and sixth groups of leaf springs mounted on opposite sides of said main spring between said main spring and said first and second groups of springs, and the ends of said third and fourth groups of springs being spaced from the ends of said fifth and sixth groups of springs to form open areas within said spring pack.

4,457,646
IMPOUNDMENT AND DIVERSION SYSTEMS FOR PREVENTING OR MITIGATING FLOODING

Daniel A. Laesch, 212 Greenwood Ave., R.R. 7, Bloomington, Ill. 61701

Filed Apr. 5, 1982, Ser. No. 365,543
Int. Cl.³ E02B 11/00
U.S. Cl. 405—52 8 Claims

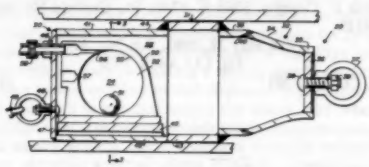


1. A system for preventing or mitigating flooding for use in conjunction with an existing drainage facility including an existing subterranean sewer conduit adequate for normal volumetric water drainage flow but subject to abnormal volumetric water flow therein, said system comprising a subterranean chamber located proximate to said drainage facility but laterally displaced from said drainage facility for impounding water from said sewer conduit, and diversion means constituted by the addition of at least one subterranean conduit interconnected with said sewer conduit for receiving water from said sewer conduit only in the event of abnormal flow in said sewer conduit for diverting water from said sewer conduit into said subterranean chamber for temporary storage therein response to abnormal volumetric water flow in said sewer conduit and for returning the temporarily stored water from said reservoir to said sewer conduit upon return to normal volumetric flow in said sewer conduit, said subterranean chamber having a floor higher than the water level defined by said sewer conduit during normal drainage flow therein, thereby preventing water normally from entering said subterranean chamber from said sewer conduit during such normal volumetric flow, said subterranean chamber having cross sectional dimensions substantially far greater than those of said sewer conduit for permitting entry of water into said subterranean chamber for temporary impoundment therein by lateral diversion of a substantial volume of water from said sewer conduit facility only upon rise of water level resulting from abnormal volumetric flow in said sewer conduit, said temporary impoundment preventing or mitigating flooding which otherwise may result from the incapability of said sewer conduit to handle said abnormal volumetric water flow.

4,457,647
RE-ROUNDING DEFLECTED UNDERGROUND PLASTIC PIPE AND REMEDYING OVER BELLING AND FAULTY GRADING THEREOF

Don L. Dusette, Santa Barbara, and Charles L. Buchert, Santa Maria, both of Calif., assignors to Con-Prod, Inc., Santa Maria, Calif.

Filed Oct. 26, 1982, Ser. No. 436,787
Int. Cl.³ F16L 1/00, 55/18
U.S. Cl. 405—154 7 Claims



1. A device for gauging and, if necessary, re-rounding flexible conduits after generally horizontal, inclined installation below ground and after the conduits have been covered with soil and compacted, so that the upper conduit wall may have been subjected to deflection, including in combination:

a casing assembly comprising (1) a central cylindrical tubular gauging portion nearly as great in diameter as the conduit, (2) a tapered forward tubular nose portion welded to the forward end of the said central portion and having an end wall with first means for attachment of a pulling cable, said tubular nose portion having air outlet openings extending forwardly at a relatively small angle to the longitudinal axis of said central portion, and (3) a narrower rear portion welded to the rear end of said central portion located eccentrically with respect to said central portion to provide continuity along the bottom of said casing assembly but recessed at the sides and top, said rear portion having a vertical rear end wall with second means for attachment of a cable and an air inlet opening,

an air-jet-driven ball-type vibrator in said rear portion having a housing enclosing a vertically disposed, circular, flat, disc-like chamber with flat side walls, extending lengthwise of said rear portion, said chamber having a tangential

inlet parallel to the longitudinally extending outlet facing said rear end wall, with a steel ball in said chamber moved by said air around said chamber to cause a vibrating action in a longitudinal vertical plane,

air inlet means extending through said air inlet opening into said tangential inlet, and

a support plate for said housing, secured rigidly to said housing and to the lower portion of said rear portion for transmitting the vertical vibrations to the bottom of said rear portion.

4,457,648

MEANS FOR CONVEYING A MIXTURE OF PRODUCTS HAVING DIFFERENT DENSITY

Karl-Axel G. Pettersson, Sollebrunn, Sweden, assignor to Sven-Erik Ahl, Vara, Sweden

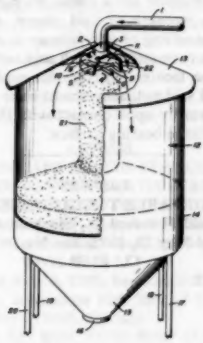
PCT No. PCT/SE81/00064, § 371 Date Nov. 9, 1981, § 102(e) Date Nov. 9, 1981, PCT Pub. No. WO81/02565, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 5, 1981, Ser. No. 321,161

Claims priority, application Sweden, Mar. 11, 1980, 8001889

Int. Cl.³ B65G *53/60*

U.S. Cl. 406—175 **4 Claims**



1. Means for introducing a compressed-air conveyed homogeneous mixture of products having different density, which products may be of grain size or powder size, from a transport pipe and into a storage container while maintaining the homogeneity of the mixture, said means comprising an outlet end on said transport pipe positioned within said storage container, a nozzle on said outlet end for the discharge of the mixture therethrough, said nozzle comprising a throughflow opening in general alignment with said outlet end for discharge of the homogeneous mixture therethrough and into the storage container, said nozzle also including compressed-air openings directed generally laterally outward into the storage container, said compressed-air openings being located between said outlet end and said throughflow opening for lateral discharge of compressed-air into a mixture-confining compressed-air sheath directly engaging and confining the mixture discharging through said throughflow opening, said nozzle further including a wall section surrounding and defining said throughflow opening, and a tapered section extending between said outlet end and said wall section to define a material passage therebetween, said compressed-air openings being formed laterally through said tapered section, said wall section defining a cross-sectional area greater than that of said outlet end, said tapered section enlarging from said outlet end to said wall section.

4,457,649

CARGO RESTRAINER WITH SPRING-BIAS LATCH

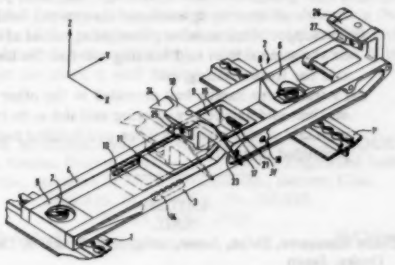
Günter Vogg; Hinrich Engel, both of Bremen, and Eckhard Koch, Lilienthal-Kleinmoor, all of Fed. Rep. of Germany, assignors to Vereinigte Flugtechnische Werke GmbH, Bremen, Fed. Rep. of Germany

Filed Jan. 13, 1982, Ser. No. 339,129

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107745

Int. Cl.³ B60P *7/08*; B61D *45/00*

U.S. Cl. 410—46 **9 Claims**



3. A restraining device, comprising:

a pair of flat bars;

connecting pieces interconnecting the bars to establish a frame-like structure having a space between the bars;

fastening means on the connecting pieces for fastening to a floor structure;

a frame element;

means for mounting the frame element to the bars inside said space and in different positions therein;

a spring-biased latch hook pivotably mounted to the frame element to normally assume an upright position, the latch hook permitted to fold down into the frame element, not to protrude beyond the upper edges of the bars, said latch hook being provided with lateral, oblique run-off-surfaces-defining extensions, so that the latch hook can be pivoted down on impact by a piece of cargo moving in the direction of said rails.

4,457,650

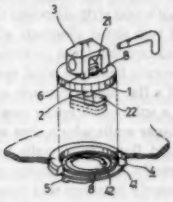
REVERSIBLE WATERTIGHT TYPE CONTAINER SECURING ASSEMBLY

Tsiung-Siung Tseng, No. 707, 3-4-28, Sakurazaka, Chuo-Ku, Fukuoka City 810, Japan

Filed Jan. 4, 1982, Ser. No. 337,013

Int. Cl.³ B60P *7/00*; B61D *45/00*

U.S. Cl. 410—111 **8 Claims**



1. A securing assembly for securing cargoes on a cargo ship comprising:

(1) a support seat having a slot on a horizontal plate thereof;

(2) a cover plate to be coupled with said support seat, said cover plate being reversible;

(3) a holding member integrally mounted on said cover plate, said holding member being protruded upward when in use and kept inside said slot after being turned downward to a storage position; and

(4) locking means for securing said cover plate relative to said support seat when the assembly is either in use or in a storage position, said locking means comprising

(i) a pair of wedge members coupled with said support seat underneath;

(ii) engaging means provided in said holding member for engaging with said wedge members when said holding member is not in use;

(iii) a bar provided vertically through said cover plate and capable of moving upward and downward freely;

(iv) a stopper block member provided at an end of said bar on the same side as said holding member for hindering said bar from rotating; and

(v) a transverse handle key provided at the other end of said bar, said handle key entering said slot to be engaged with said wedge members when said holding member is protruded upward.

4,457,651

NAIL

Takeo Hasegawa, Shiga, Japan, assignor to Wakai & Co., Ltd., Osaka, Japan

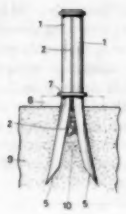
PCT No. PCT/JP81/00027, § 371 Date Oct. 13, 1981, § 102(e) Date Oct. 13, 1981, PCT Pub. No. WO81/02450, PCT Pub. Date Sep. 3, 1981

PCT Filed Feb. 17, 1981, Ser. No. 314,093

Claims priority, application Japan, Feb. 22, 1981, 55-22671

Int. Cl.³ F16B *13/04, 15/04*

U.S. Cl. 411—29 **8 Claims**



1. A nail adapted to be driven into a material comprising a pair of longitudinally extending shank elements, fixing means fixing together one longitudinal end portion of said shank elements, the other end of said shank elements having tapered end portions, a longitudinally extending strip disposed between said shank elements, and a clamping element disposed about the outside of said shank elements for holding together said shank elements with said strip disposed therebetween said nail consisting of said two shank elements with said strip therebetween having solid circular cross sectional configuration, each of said shank elements having a solid semi-circular configuration composed of a flat planar portion and a circular portion, said strip having a solid rectangular configuration with a pair of opposed flat planar walls which abut said flat planar portion of said shanks, said flat planar walls having a width corresponding substantially to the diameter of said nail, said strip being disposed entirely between said shank elements, said strip being constructed and arranged such that when said nail is driven into said material, said shank elements spread apart as said strip engages said material and is deformed in a lateral direction to exert a lateral force on said shank elements to spread apart said shank elements, said clamping element sliding longitudinally on said shank elements to permit said shank elements to spread apart as said nail is driven into said material.

4,457,652

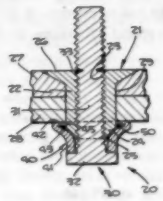
COMPOSITE BUCKLING BLIND FASTENER

John D. Pratt, Rancho Cucamonga, Calif.

Filed Apr. 13, 1981, Ser. No. 253,783

Int. Cl.³ F16B *19/10*

U.S. Cl. 411—38 **9 Claims**



1. In a blind fastener comprising (a) a nut with an axial bore therethrough and with a nose at one end and an enlarged head at the other end, (b) a bolt having a stem extending through said nut and having an enlarged head adjacent to said nut nose, and (c) a sleeve on said bolt stem between said nut nose and said bolt head, the improvement which comprises said sleeve having a thick wall section adjacent to said bolt head and a thin wall section adjacent to said nut nose formed by a recess in said section and a collar on said bolt stem between said nut nose and said sleeve which collar has a tensile strength very much less than the tensile strength of said sleeve, said sleeve being adapted upon the setting of said fastener to initially expand its thin wall section over said nut with said collar therebetween, then to have the free end of the thin wall section tapered inwardly toward said nut, and then to have the thin wall section buckle outwardly upon contact with the parts being fastened to form a large bearing surface.

4,457,653

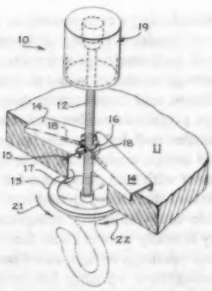
RETRIEVABLE TOGGLE ASSEMBLY

David S. Leib, 9105 Hereford Ct., Stockton, Calif. 95209

Filed May 28, 1982, Ser. No. 383,279

Int. Cl.³ F16B *21/00*

U.S. Cl. 411—342 **7 Claims**



1. A retrievable fastener assembly for holding an object to a wall or ceiling panel comprising an elongate threaded bolt, fastening means threadedly carried by said bolt for movement therealong to act against the back side of the panel to permit said bolt to be tightened against said panel by screwing said bolt in a first direction, the last named means comprising a pair of mutually hinged toggle elements threadedly carried by said bolt to be moved betwen advanced and retracted positions therealong, and means yieldingly urging said elements to move away from said bolts, the region around that portion of said

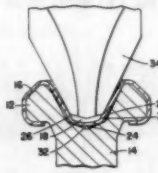
bolt protruding beyond the back of the panel being substantially unobstructed with respect to said elements in all radial directions to permit said elements to move freely away from said bolt in substantially all radial directions free of obstruction, and cup-shaped means carried axially of said bolt and disposed for receiving both said toggle elements in a mutually folded condition in response to unscrewing said bolt in a direction opposite said first direction.

4,457,654

TOOL GRIPPING FASTENER

Henry A. Sygnator, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 26, 1982, Ser. No. 362,223
Int. Cl.³ F16B *23/00*
U.S. Cl. 411—408 **9 Claims**



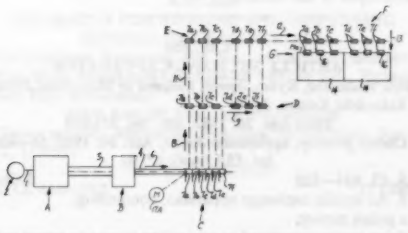
5. A fastener assembly comprising a fastener and a cap, said fastener having a head including a recess defined by a plurality of surfaces therein, said cap covering a substantial portion of said head and closely conforming to said head and said recess surfaces, said cap being in spaced relation with said surfaces of said recess and cooperating therewith to resiliently grip an installation tool inserted into said recess.

4,457,655

METHOD AND APPARATUS FOR ASSEMBLING PRONGED BINDING STRIPS WITH STACKS OF PAPER SHEETS OR THE LIKE

Paul Fabrig, Neuffen, Fed. Rep. of Germany, assignor to Womako Maschinenkonstruktionen, Nürtingen, Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 317,943
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042183; May 5, 1981, 3117659
Int. Cl.³ B42C *19/00*; B21F *45/00*
U.S. Cl. 412—7 **61 Claims**



1. A system for conveying C-shaped binding strips from a conveyor to a binding station at which the strips are inserted into the perforations of stacked sheets, comprising a pair of jaws; means for moving said jaws between said conveyor and said station; and means for shifting said jaws relative to each other so that said jaws can engage a binding strip in the region of said conveyor, deliver the strip from said conveyor to said station, and insert the strip into the perforations of sheets at said station, said shifting means including means defining paths for said jaws which make an oblique angle, and said paths being located in a plane which is at least substantially normal to the axis of a binding strip between said jaws.

2. A method of binding marginally perforated stacks of sheets with pronged binding strips comprising the steps of:

(a) advancing a strand of coherent pronged binding strips having respective axes along a predetermined path;

(b) supplying marginally perforated stacks of sheets to a binding station;

(c) substantially simultaneously severing at least two binding strips from the strand in a predetermined portion of said path to obtain a group of discrete strips;

(d) transferring the group of discrete strips from said path to said binding station as a unit, including moving the strips of the group transversely of their axes and spreading the strips of the group in the axial direction of the strips; and

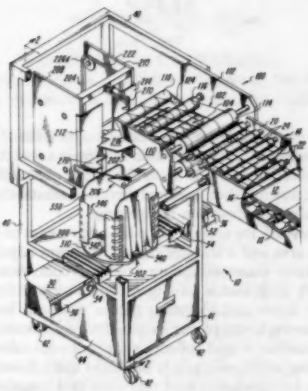
(e) introducing the spread strips into the perforations of at least one stack at said binding station.

4,457,656

STACK ASSEMBLING APPARATUS AND TECHNIQUE

Paul C. Kosina, Denver, and George E. Koltko, Englewood, both of Colo., assignors to Nolan Systems, Inc., Denver, Colo.

Filed Jan. 30, 1981, Ser. No. 230,018
Int. Cl.³ B65G *57/03*
U.S. Cl. 414—31 **19 Claims**



1. Apparatus for assembling a stack of flat sheet-like articles from a stream of said articles, comprising:

input delivery means receptive of the stream of articles and for serially conveying and delivering each of said articles into a free space within said apparatus in a generally planar manner along a predetermined trajectory;

formation means receptive of the articles delivered into the free space along the predetermined trajectory and for forming a predetermined number of said articles into a layered batch, said formation means comprising: carriage means including a generally planar support surface element upon which to support the lowermost article in each batch as the batch is formed, and transport means operatively connected for moving said carriage means in a closed figure movement path while maintaining the support surface element at a predetermined angle throughout movement in the closed figure path, the support surface element of said carriage means moving through the free space during a portion of the movement of the carriage means in the closed figure movement path;

stack delivery means receptive of the batches of articles and for assembling a predetermined number of batches into the stack of articles, the predetermined number of batches in a stack being at least one; and

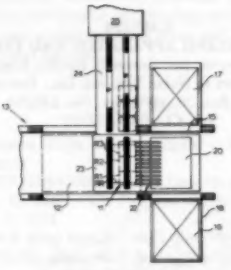
wherein said formation means further comprises door gate means for operatively removing the batch of articles from the support surface element of said carriage means during movement of said carriage means in the movement path, said door gate means further selectively releasing each removed batch for free fall movement to said stack delivery means.

4,457,657

INTEGRAL PAPER COLLECTION AND TRANSFER ASSEMBLY

Arthur T. Karis, Lenox, and Peter J. Eberth, Tyringham, both of Mass., assignors to Beloit Corporation, Beloit, Wis.

Filed Jul. 21, 1981, Ser. No. 285,482
Int. Cl.³ B65H 31/30
U.S. Cl. 414—45 **26 Claims**



12. A unitary assembly for collecting a pile of sheets discharged seriatim into a collection area from a sheeting machine and transferring said pile away from said collection area in a first direction and then a second direction substantially orthogonal to said first direction comprising:

a framework for supporting a lift table means in said collection area and a transfer conveyor means adjacent to said lift table means extending from said collection area,

said lift table means having a planar surface for receiving said sheets and elevating means mounted between said framework and planar surface for reciprocating said planar surface in said collection area between raised positions during which said pile is collected and a lowermost position for depositing said pile onto said transfer conveyor means,

said transfer conveyor means having a belt conveyor means adjacent said lift table means for transporting said pile in said first direction and a slat conveyor means adjacent said belt conveyor for transporting said pile in said second direction, wherein said slat conveyor comprises:

a generally planar top surface,

a longitudinal opening in said top surface running in said second direction,

a slat chain means mounted for endless loop rotation in said opening with an upper portion thereof facing upward from said opening, including a drive chain and a series of individual slats connected to said drive chain with planar surfaces overhanging opposed sides of said drive chain,

opposed ledge surfaces facing across said opening for supporting the slats in said upper portion of said slat chain along their planar surfaces in a receiving position substantially recessed in said top surface and tilted toward said first direction to facilitate receipt thereover of said sheet pile from said first direction,

a guide member mounted for longitudinal back and forth movement beneath said upper portion of said slat chain and having an upper surface for engaging said upper portion for movement thereover and a lower profiled surface portion,

a support surface means for engaging said profiled surface portion, and

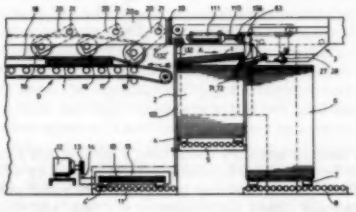
drive means for moving said guide member such that by movement one way said slats in said upper portion are in their respective position and by movement the opposite way said slats in said upper portion are in a transport position substantially elevated over said top surface with planar surfaces level to support said ream pile for transfer in said second direction.

4,457,658

DEVICE FOR INTRODUCING A BATCH OF SHEETS INTO A PROCESSING MACHINE

Georges Meylan, Prevereneges, Switzerland, assignor to Bobst SA, Switzerland

Filed Feb. 2, 1982, Ser. No. 345,149
Claims priority, application Switzerland, Feb. 3, 1981, 718/81
Int. Cl.³ B65G 59/02
U.S. Cl. 414—114 **10 Claims**



1. A device for separating a batch of sheets from a pile of sheets and introducing the batch into a conveyor of a machine designed for processing said sheets, the device comprising a frame with a fixed stop having a movable stop member mounted in the frame adjacent the fixed stop; first means for moving the stop member between a first position aligned with the fixed stop to a second position to create a discharge opening between the fixed stop and the movable stop member; second means for moving a pile of sheets in one direction perpendicular to the plane of the sheets with one end of the pile being adjacent said movable stop member; means cooperating with the movable stop member being held by said first means in the first position for separating a batch of sheets from said one end of the pile and third means for moving said batch of sheets in a second direction parallel to the plane of the sheets in the pile through the discharge opening for introduction into a conveyor of the machine.

4,457,659

ARTICLE EXCHANGE APPARATUS

Akira Watanabe, Kyoto, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 26, 1982, Ser. No. 371,955
Claims priority, application Japan, Apr. 30, 1981, 56-66284
Int. Cl.³ B65G 47/90
U.S. Cl. 414—223 **5 Claims**

1. An article exchange apparatus, comprising:

a prime mover;

drive means connected to said prime mover to rotate and to stop said prime mover through a plurality of operation cycles; mover for movement by said prime mover during a first and and a second indexing term, and stopable by said prime mover during a first and second stoppage term, for each movement of said prime mover through one operation cycle thereof, said indexing and stoppage terms alternating in time with each other;

a second follower unit engaged with said prime mover for movement by said prime mover during a first and a second indexing term and stopable by said prime mover during a

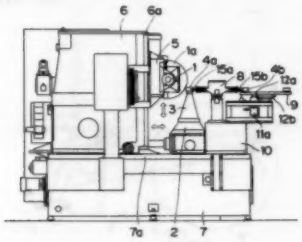
first and a second stoppage term, for each movement of said prime mover through one operation cycle thereof, said indexing and stoppage terms alternating in time with each other;

said first and second follower units engaged with said prime mover so that while one of said follower units is in a stoppage term the other of said follower units is in an indexing term, said first indexing term of said first follower unit having a first one half portion and a second one half portion;

a conveyor arm for moving articles;

mounting means connected to said conveyor arms for permitting elevating and lowering movement of said conveyor arm and rotation of said conveyor arm;

a chuck connected to said conveyor arm for movement between an open position for releasing an article at a closed position for gripping an article;



said first follower unit operatively connected to said chuck for moving said chuck to said open position during said first one half portion of said first indexing term and for moving said chuck to said closed position during said second one half portion of said first indexing term;

said second follower unit operatively connected to said conveying arm for elevating said conveying arm during said first indexing term of said second follower unit and for lowering said conveyor arm during said second indexing term of said second follower unit; and

said first follower unit operatively connected to said conveying arm for rotating said conveying arm during said second indexing term of said said follower unit;

whereby an article can be moved from one location to another location during each operation cycle of said prime mover.

4,457,660

APPARATUS FOR STORING AND DISPENSING SEVERAL BULK MATERIALS

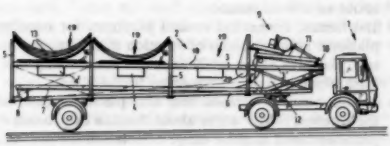
Horst Pippinger, Karlsruhe, Fed. Rep. of Germany, assignor to Elba-Werk Maschinen-Gesellschaft mbH & Co., Ettlingen, Fed. Rep. of Germany

Filed Aug. 10, 1982, Ser. No. 406,886

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135197

Int. Cl.³ B65G *3/20*

U.S. Cl. 414—332 **12 Claims**



1. An apparatus for the metered dispensing of several bulk materials, said apparatus comprising:

an elongated and horizontal frame having a pair of longitudinal sides and provided with a longitudinally extending floor;

pairs of posts spaced along said floor and subdividing same longitudinally into a row of zones;

respective legs at said posts holding said frame above the ground;

respective transverse end walls releasably secured to said posts and longitudinally bounding said zones;

respective horizontal floor sections extending laterally from said frame toward said side walls and forming horizontal lateral extensions of said floor;

respective longitudinal side walls releasably secured to said posts and transversely bounding said zones, whereby each zone is formed into an upwardly open hopper;

respective floor valves in said floor at said zones and openable to release bulk material from the respective hoppers through said floor;

a track fixed to said frame and extending longitudinally underneath said zones; and

a bucket car displaceable along said track underneath said valves.

4,457,661

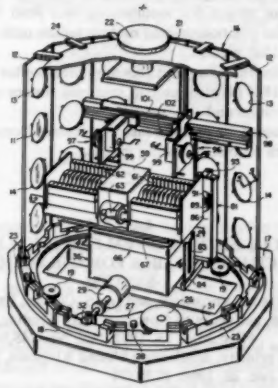
WAFER LOADING APPARATUS

Alan G. Flint, Los Gatos, and William G. Jacobs, San Jose, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Dec. 7, 1981, Ser. No. 328,408

Int. Cl.³ B65G *65/00*

U.S. Cl. 414—404 **21 Claims**



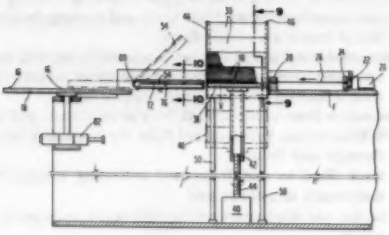
1. Apparatus for transferring wafers between a storage magazine and processing trays having a plurality of wafer holding positions spaced along the same, comprising a multifaceted generally cylindrical carousel on which the trays are removably mounted with the wafer holding positions aligned generally parallel to the axis of the carousel, drive means for rotating the carousel about its axis to bring successive ones of the trays into a predetermined wafer loading position, an elevator assembly mounted within the carousel for movement in the axial direction between the wafer holding positions, wafer holding chuck means mounted on the elevator assembly for movement in a radial direction toward and from a tray in the wafer loading position, and means for transferring the wafers between the storage magazine and the chuck means.

4,457,662

AUTOMATIC LEAD FRAME LOADING MACHINE

Ronald Ireland, Philadelphia, and Harold R. Powell, King of Prussia, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 25, 1982, Ser. No. 361,936
Int. Cl.³ B65G *1/06, 25/04*
U.S. Cl. 414—331 **16 Claims**



1. Apparatus for automatically rapidly precisely loading lead frames onto a loading frame comprising

magazine means for vertically storing a plurality of said lead frames,

nesting means adjacent said magazine means for receiving said lead frames ejected therefrom,

means for pivoting said nesting means about 180° to invert said lead frames ejected thereon for loading thereof onto said loading frame, said nesting means having recesses therein for completely receiving lead frames longitudinally thereon ejected from said magazine means, said recesses providing front walls with said nesting means for precise positioning of said lead frames individually in said recesses during said pivoting of said nesting means,

retaining means for maintaining said lead frames in said precise position on said nesting means until completion of said 180° pivot,

means for releasing said retaining means after completion of said 180° pivot to unload said lead frames onto said loading frame, and

other means for pushing said lead frames from said magazine means onto said nesting means.

4,457,663

VEHICLE ENTRY SYSTEM FOR INVALIDS AND A WHEEL CHAIR SUITABLE FOR USE WITH THE ENTRY SYSTEM

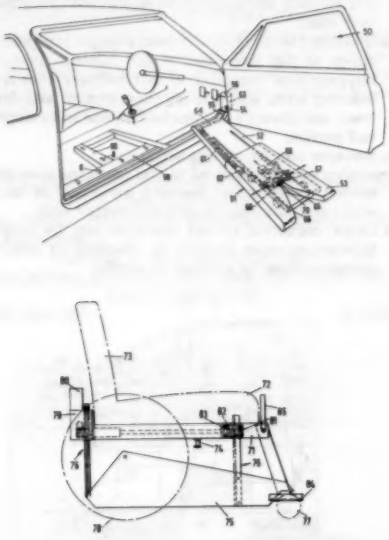
Colin E. Hems, Northfield, and Ian S. Copsey, Fair Oak, both of England, assignors to Gowrings Ltd., Reading, England

Filed Mar. 18, 1981, Ser. No. 245,048
Claims priority, application United Kingdom, Mar. 19, 1980, 8009301; Jun. 20, 1980, 8020324
Int. Cl.³ B60P *3/00, 1/64*
U.S. Cl. 414—522 **18 Claims**

1. A vehicle entry system for use by invalids in entering a motor vehicle through a door opening, comprising:

a platform;

means for swivellably and non-tiltably mounting the platform in the motor vehicle for movement about a swivel axis which is located adjacent the forward end of the platform and between a first loading or unloading position in which the platform projects outwardly through the door opening in the vehicle and a second position which is angularly displaced from the first position and in which the platform is housed entirely within the vehicle, the seivel axis being offset from a central longitudinally extending line towards that side thereof which, in use, in the second position of the platform, lies adjacent to the door opening; and



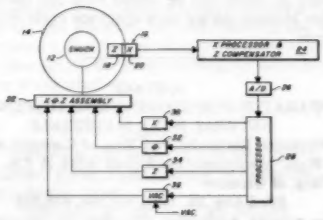
means for releasably retaining the platform in the second position.

4,457,664

WAFER ALIGNMENT STATION

Neil H. Judell, Jamaica Plain; Robert C. Abbe, Newton; Noel S. Poduje, Needham Heights, and Roy Mallory, Bedford, all of Mass., assignors to ADE Corporation, Newton, Mass.

Filed Mar. 22, 1982, Ser. No. 360,386
Int. Cl.³ B65G *47/24*
U.S. Cl. 414—779 **23 Claims**



1. Apparatus for aligning a wafer about its centroid, comprising:

a platform for removably holding said wafer for rotation about an axis of rotation;

a first means, connected to said platform, for rotating said platform about the axis of rotation θ radians, for moving said platform along an X axis, and for moving said platform along a Z axis orthogonal to the X axis;

a second means positioned near said platform responsive to the rotation of the wafer about the axis of rotation over a predetermined angular range of rotation for providing an electrical signal having values that are representative of the position of the edge of said wafer along said X axis relative to the axis of rotation as the wafer rotates through said predetermined angular range; and

a third means coupled to said first means and responsive to said electrical signal for providing data representative of the location of the centroid of said wafer relative to the axis of rotation and for producing from said data a plurality of corrective signals to said first means for aligning said centroid of said wafer about the axis of rotation.

4,457,665

METHOD FOR REMOVING INDIVIDUAL ARTICLES FROM A STACK

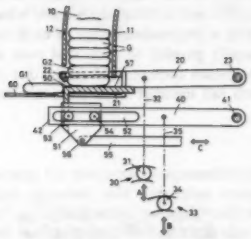
René Fluck, Schleitheim, Switzerland, assignor to Sig Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed May 11, 1982, Ser. No. 377,049

Claims priority, application Switzerland, May 12, 1981, 3082/81

Int. Cl.³ B65G *59/06*

U.S. Cl. 414—786 **6 Claims**



1. A method for removing at least one flat article at a time from an at least approximately vertical stack of articles supported on a support surface, comprising: pushing at least the lowermost article in the stack sideways away from the stack by moving an ejector member transversely to the stack; and approximately simultaneously with the contact of the ejector member at the lowermost article, lowering the support surface in such a manner that the ejector member ejects the lowermost article from the stack during free fall of the lowermost article wherein said step of lowering comprises lowering the support surface at a speed greater than the free fall velocity of the stack at least prior to the initial contact between the ejector member and the lowermost article, and the steps of pushing and lowering are carried out in a manner to cause the lowermost article to undergo free fall at least until the lowermost article has been pushed entirely away from beneath the next article in the stack above the lowermost article.

4,457,666

APPARATUS AND METHOD FOR DERIVING ENERGY FROM A MOVING GAS STREAM

W. Robertson Selman, Jr., Houston, Tex., assignor to The Windgrabber Corporation, Houston, Tex.

Filed Apr. 14, 1982, Ser. No. 368,419

Int. Cl.³ F03D *3/04*

U.S. Cl. 415—2 R **21 Claims**

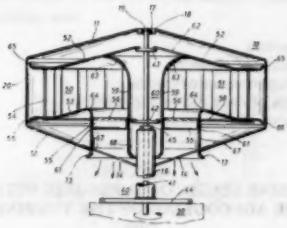
1. An apparatus for converting energy from a moving gas stream comprising:

a rotatable frame mounted on a rotatable shaft and having a plenum with an inlet and an outlet, said frame being fixed in relation to the rotatable shaft to thereby rotate the shaft upon movement of the frame;

a series of working blades mounted across the plenum in close proximity to the plenum inlet;

a series of discharge blades mounted across the plenum at a location sufficiently downstream of the working blades such that the arrangement of the discharge blades materially reduces any back pressure on the working blades; and

flow control means fixed in relation to the frame and the moving gas stream, said flow control means being operatively connected to the frame for guiding the flow of the moving gas stream into the plenum inlet in a direction generally normal to the working blades without substantially diverting the general flow of the moving gas stream prior to impingement of the moving gas stream on the working blades.



4,457,667

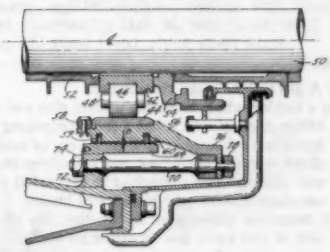
VISCOUS DAMPER WITH ROTOR CENTERING MEANS

Willard J. Seibert, Manchester, Conn., and Wesley B. Hill, Marco Island, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 215,302, Dec. 11, 1980, abandoned. This application Nov. 15, 1982, Ser. No. 441,894

Int. Cl.³ F04D *29/04*

U.S. Cl. 415—174 **2 Claims**



2. For turbine type power plant having a given thrust specific fuel consumption and having a rotor enclosed in a casing having a rotatable shaft supporting a plurality of compressor blades at one end and a plurality of turbine blades at an opposite end, at least two bearings axially spaced along said shaft for rotatably supporting said shaft and one of said bearings mounted intermediate said compressor blades and said turbine blades, fluid damper means on one of said bearings including a cavity adjacent said one bearing in which fluid is fed to support said bearing when in the rotating mode, said shaft being distortable as a function of the depth of said cavity and radially displacing said compressor blades a similar amount, the tips of said blades being sufficiently spaced to prevent touching of the inner diameter of said casing, means for improving the thrust specific fuel consumption by decreasing the distance of displacement of the tips of said blades including a spring means attached to said one bearing for preventing said one bearing from displacing the depth of said cavity wherein the rate of said spring is selected to minimize the deflection of said rotor relative to load manifested thereon by acceleration and gyroscopic forces when the shaft accelerates to its steady state operating speed where said spring rate is calculated in accordance with the formula

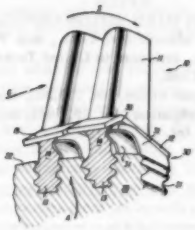
$$\frac{P}{\Delta} = \frac{12EiN}{L^3}$$

where:
P=load
Δ=deflection
E=modulus of elasticity
i=bending moment of inertia
L=length of each rod of the spring
N=number of rods.

4,457,668
GAS TURBINE STAGES OF TURBOJETS WITH DEVICES FOR THE AIR COOLING OF THE TURBINE WHEEL DISC

Claude C. Hallinger, Le Mee sur Seine, France, assignor to S.N.E.C.M.A., Paris, France

Filed Apr. 6, 1982, Ser. No. 366,134
Claims priority, application France, Apr. 7, 1981, 81 06914
Int. Cl.³ F01D 5/08
U.S. Cl. 416—95 **7 Claims**



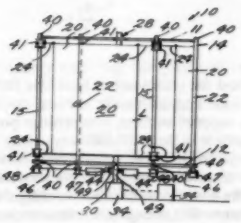
1. A gas turbine stage comprising:
(a) a turbine wheel including a rotor disc and a plurality of blades each of which has a foot comprising a blade root fitted into a housing in the periphery of said rotor disc, a shank atop said blade root, and a platform atop said shank, said platform being attached to the airfoil portion of the associated one of said plurality of blades;
(b) means for blowing air in the direction of the upstream side of said rotor disc to create an air flow from the upstream side of said rotor disc, through the plurality of passages delimited by the periphery of said rotor disc, said shanks, and said platforms, to the downstream side of said rotor disc; and
(c) a plurality of trough-shaped vibration dampers made of an elastic material, each of said vibration dampers being fitted into one of said passages such that its bottom portion pushes against the associated one of said platforms, each of said vibration dampers being sized and shaped so that it occupies substantially all the cross section of the associated one of said passages, and the bottom portion of each of said vibration dampers having an upstream edge which extends upstream of the upstream edge of said rotor disc and which is curved toward the axis of said turbine wheel to form an air pickup scoop.

4,457,669
JIBE MILL

William R. Corry, 3616 Mattison, Fort Worth, Tex. 76107

Filed Oct. 24, 1978, Ser. No. 954,081
Int. Cl.³ F03D 7/06
U.S. Cl. 416—119 **9 Claims**

1. A windmill comprising:
a frame, said frame comprising upper and lower frame sections, and six symmetrically disposed mast sections interconnecting said upper and lower frame sections so that said upper and lower frame sections are substantially parallel to each other with said mast sections substantially transverse to planes defined by said upper and lower frame sections, three of said mast sections comprising sail masts, and three of said mast sections comprising sheet masts, each sheet mast being disposed between two sail masts, and vice versa, and said frame further comprising six spokes extending from each of said upper and lower frame sections, each spoke extending to a mast section, three of the spokes extending from each of said upper and lower frame sections comprising sail spokes, and three of the spokes extending from each of said upper and lower frame sections comprising sheet spokes, each sail spoke being disposed between two sheet spokes, and vice versa;
a plurality of substantially quadrate sail members of flexible material, consisting of three sail members;
means for operatively attaching each sail member to at least one mast section so that it may assume different orientations with respect to each said mast section; so that the sail members may jibe and without blockage of wind to the lee sail; and so that a longitudinal edge of each sail member remains generally parallel to each said mast section despite the orientation thereof, said means for operatively attaching each sail member to at least one mast section



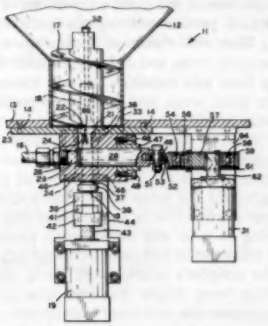
comprises a sleeve forming a first longitudinal edge of each sail member and receiving a sail mast therein, and a sheet attached to a second longitudinal edge of each sail member, opposite said first edge, and attached to a sheet mast adjacent the sail mast to which the sail member is attached;
means for mounting said frame for rotational movement about an axis parallel to said mast sections, in response to wind;
means for transforming rotational movement of said frame into a useful energy form; and
self-reefing means for modifying the effective area each sail member presents to the wind in response to wind velocity, said self-reefing means comprising: means for mounting each of said mast sections for rotation with respect to said upper and lower frame sections about an axis concentric with each mast section; means for mounting each said sheet to each sheet mast to take-up and let-out the sheet length in response to rotation of each said sheet mast; each said sleeve for attaching each said sail member to each said sail mast providing means for effecting take-up and let-out of the amount of sail in response to rotation of each said sail mast; and centrifugal responsive means for effecting coincident rotation of said sail and sheet masts in response to the speed of rotation of said frame.

4,457,670

METHODS AND APPARATUS FOR PUMPING COMPRESSIBLE DYNAMOELECTRIC MACHINE LUBRICANT MATERIAL

James M. Tomson, Fort Wayne, and Richard C. Bohde, New Haven, both of Ind., assignors to General Electric Company, Fort Wayne, Ind.

Filed Sep. 28, 1978, Ser. No. 946,554
Int. Cl.³ F04B 23/10
U.S. Cl. 417—53 1 Claim



1. Apparatus for pumping compressible lubricant retaining and wicking material, said apparatus comprising: a supply hopper for accommodating wicking material, and having a mixing and feeding auger therein, and also having an outlet through which wicking material is movable under the influence of the auger; a first prime mover interconnected with the auger for driving the auger; two flow control vanes pivotally supported in the apparatus and located to control the flow of material with respect to the outlet of the supply hopper, said vanes being movable between opened and closed positions; means for maintaining a minimum spacing between said vanes when in the opened positions so that material tending to flow in a reverse direction past the vanes while the vanes are in the opened positions will cause the vanes to move to closed positions; said apparatus further comprising a piston pump in communication with the outlet of the supply hopper and having a discharge means, and a second prime mover drivingly connected with the pump for causing operation thereof; said pump being operative to pull material thereinto past the vanes while the auger is supplying material under pressure to the hopper outlet; and said pump further being operative to push material therefrom against the vanes and cause the vanes to close against material being continuously forced thereagainst by the auger, whereby material pushed from the pump is prevented from moving back into the hopper and is forced to flow through the pump discharge means.

4,457,671

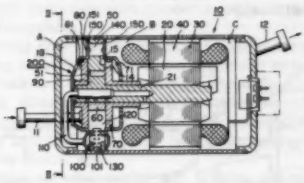
HERMETIC TYPE ROTARY COMPRESSOR WITH SILENCER MEANS

Yoshikuni Watanabe, Fujinomiya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 3, 1982, Ser. No. 374,029
Claims priority, application Japan, May 11, 1981, 56-67678
Int. Cl.³ F04B 21/00; F04C 18/00
U.S. Cl. 417—312 8 Claims

1. In a horizontal hermetic type rotary compressor of the type comprising an outer hermetic casing provided at both its end portions with a suction pipe and a discharge pipe for a flow medium, a compression device contained in said casing and connected to said suction pipe, and an electric motor operatively connected to said compression device, said compression device comprising a cylinder body, and main and sub-bearings located on the respective side portions of said cylinder body, said cylinder body being provided with silencer means, the improvement in which said silencer means comprises:

a plurality of silencer chambers which communicate with each other and which are formed in said cylinder body at portions outside of the peripheral edges of said main and sub-bearings; and,



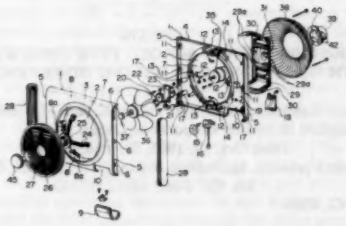
a pair of cover plates located on both sides of said cylinder body so as to hermetically seal openings of said silencer chambers, said cover plates being secured to said cylinder body by tubular rivets.

4,457,672

FAN WITH VARIABLE AXIS IMPELLER

Masato Ogura, and Noriyasu Horio, both of Gifu, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1981, Ser. No. 329,473
Claims priority, application Japan, Mar. 23, 1981, 56-41906; Mar. 27, 1981, 56-43046[U]; Mar. 30, 1981, 56-44775[U]
Int. Cl.³ F04B 17/00, 35/04; F04D 29/56
U.S. Cl. 417—360 9 Claims



1. A fan assembly comprising:

a casing having a front surface and a rear surface which define an air passage therebetween;

a first electric motor;

an impeller adapted for rotation by said motor;

a grill located over said front surface of said casing for altering a direction of a current of air produced by said impeller;

a main body support located on said rear surface of said casing; and

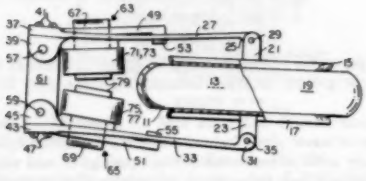
a mounting member for securing said fan assembly to a ceiling or wall;

means for fixedly engaging said mounting member to said main body support in any one of a plurality of positions to prevent movement therebetween, said main body support and said mounting member having mating surfaces which are inclined at a predetermined angle, each of said predetermined positions defining a unique and fixed spacial orientation of an axis of said impeller.

4,457,673
PUMP AND ACTUATOR MECHANISM

Michael G. Conley, El Cerrito, and James S. Petrek, Berkeley, both of Calif., assignors to Novacor Medical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 211,210, Nov. 28, 1980, Pat. No. 4,384,829. This application Dec. 3, 1982, Ser. No. 446,453
Int. Cl.³ F04B 43/04
U.S. Cl. 417—412 7 Claims

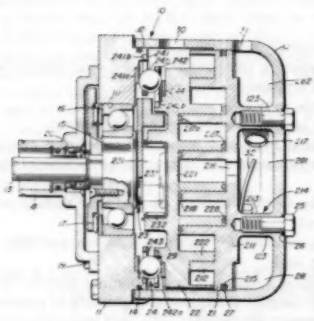


1. A pump comprising a flexible enclosure defining a pump chamber, a pusher element engaged with said enclosure and being movable reciprocally from a first to a second position for expelling the contents of the pump chamber, and an actuator mechanism for moving said pusher element between its said positions, said mechanism comprising an elongated beam spring having one end coupled to said pusher element, means supporting the other end of said beam spring for pivotal movement about an axis extending transversely of the beam spring axis, said supporting means including means for preloading said beam spring in one position, in which, with said pusher element in said first position, said beam spring is relatively less stressed, and means for pivoting said beam spring about said axis from said one position to another position in which, with said pusher element in said first position, said beam spring is relatively more stressed, whereby in relieving said stress, said one end of said beam spring is displaced to move said pusher element to its second position.

4,457,674
HIGH EFFICIENCY SCROLL TYPE COMPRESSOR WITH WRAP PORTIONS HAVING DIFFERENT AXIAL HEIGHTS

Akihiro Kawano, and Kiyoshi Terauchi, both of Gunma, Japan, assignors to Sanden Corporation, Japan

Filed Oct. 12, 1982, Ser. No. 433,897
Claims priority, application Japan, Oct. 12, 1981, 56-162210
Int. Cl.³ F04C 18/02, 23/00
U.S. Cl. 418—5 10 Claims



1. In a scroll type compressor including a housing having a fluid inlet port and a fluid outlet port, a fixed scroll fixedly disposed relative to said housing and having a circular end plate from which a first spiral wrap extends axially into an operative interior area of said housing, an orbiting scroll having a circular end plate from which a second spiral wrap axially extends, said first and second spiral wraps interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets within said operative interior area, a driving mechanism operatively connected to said orbiting scroll to effect orbital motion of said orbiting scroll so that the volume of the fluid pockets changes during the orbital motion of said orbiting scroll, the improvement comprising:

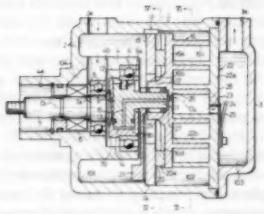
a transition portion on the spiral wrap of one of said scrolls, said transition portion defining an inner wrap portion extending from said transition portion toward the inner end of the spiral wrap, and defining an outer wrap portion extending from said transition portion toward the outer end of the spiral wrap, said inner wrap portion having a greater axial height than said outer wrap portion; and

a stepped portion on the end plate of the other of said scroll members generally in registry with said transition portion, said stepped portion defining an inner end plate portion extending within the wrap affixed to its end plate from said stepped portion toward the center of said other scroll, and defining an outer end plate portion extending within the wrap affixed to its end plate from said stepped portion toward the periphery of said other scroll, said inner end plate portion being deeper than said outer end plate portion to accommodate said inner wrap portion therein.

4,457,675
VOLUMETRIC FLUID COMPRESSOR DEVICE

Mitsukane Inagaki, Anjyo; Mitsuhiro Hattori, Kariya, and Hiromitsu Ono, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Jun. 7, 1982, Ser. No. 385,981
Claims priority, application Japan, Jun. 12, 1981, 56-91310
Int. Cl.³ F04C 18/02, 15/04
U.S. Cl. 418—14 9 Claims



1. In a volumetric fluid compressor comprising a housing, a rotary shaft rotationally mounted on the housing and having an inner end inside the housing, a groove portion provided at the inner end of the rotary shaft and extending in the diametral direction of the shaft, a slider radially slidably situated in the groove portion and having an offset pin extending parallel to the rotary shaft, a resilient member to urge the slider toward the center of the shaft, a movable scroll member rotationally connected to the offset pin and non-rotationally situated relative to the housing, and a fixed scroll member attached to the housing and being sealingly engaged relative to the movable scroll member, the improvement comprising bearing means situated around the inner end of the rotary shaft for rotationally supporting the inner end of the shaft relative to the housing, a pressure chamber provided at the innermost end of the groove portion and defined by the slider, said resilient member beng situated between the bearing means and the slider to urge the slider inwardly, and pressure conduction means provided in the movable scroll member and the slider for introducing the pressurized fluid into the pressure chamber to urge the slider outwardly against the resilient member by the pressurized fluid

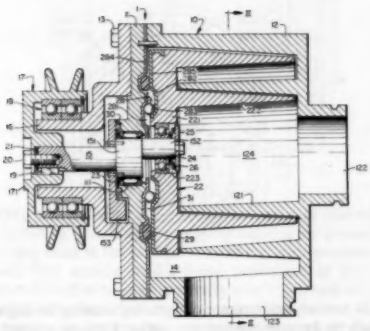
introduced thereinto so that the offset condition of the movable scroll member is controlled by the operation efficiency of the compressor.

4,457,676

DRIVING SUPPORT MECHANISM FOR AN ORBITING SCROLL OF A SCROLL TYPE FLUID DISPLACEMENT APPARATUS

Masaharu Hiraga, Honjo, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed May 26, 1982, Ser. No. 382,086
Claims priority, application Japan, May 27, 1981, 56-81702
Int. Cl.³ F01C *1/02*; F04C *2/02*
U.S. Cl. 418—55 **5 Claims**



1. In a scroll type fluid displacement apparatus including a housing having an inlet port and an outlet port, a fixed scroll fastened to said housing and having a first end plate from which a first wrap extends into an operative interior area of said housing, an orbiting scroll having a second end plate from which a second wrap extends, said first and second wraps interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of fluid pockets within said operative interior area, a driving mechanism connected to said orbiting scroll to drive said orbiting scroll in an orbital motion, and rotation preventing means for preventing the rotation of said orbiting scroll so that the volume of the fluid pockets changes during the orbital motion of said orbiting scroll, the improvement comprising a driving mechanism including a drive shaft rotatably supported by said housing, a crank pin axially projecting from an inner end of said drive shaft, said second end plate of said orbiting scroll having a centrally located opening, said crank pin being rotatably carried in said centrally located opening by a bearing, a radial flange fastened to the inner end of said crank pin and spring means disposed between said radial flange and said bearing for urging said orbiting scroll against said rotation preventing means.

4,457,677

HIGH TORQUE, LOW SPEED HYDRAULIC MOTOR

William H. Todd, 5530 Renolda Dr., Winston-Salem, N.C. 27106

Filed Dec. 4, 1981, Ser. No. 327,271
Int. Cl.³ F03C *2/08*
U.S. Cl. 418—61 B **11 Claims**

1. A hydraulic motor adapted for high torque, low speed operation, and comprising

a housing having a fluid inlet port and a fluid outlet port,

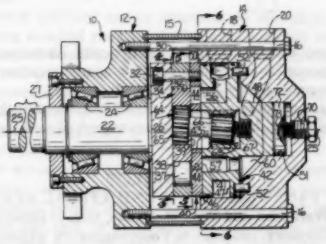
a drive shaft rotatably mounted within said housing, and defining a drive shaft axis,

gerotor means mounted within said housing and comprising an externally toothed star and an internally toothed outer ring, said star being mounted eccentrically within said outer ring so as to define fluid chambers between the teeth thereof, with said outer ring being fixed coaxially to said drive shaft,

valve means mounted within said housing for directing pressurized hydraulic fluid from said inlet port to selected ones of the fluid chambers, while exhausting fluid to said outlet port from selected others of the fluid chambers, and so as to selectively expand and contract the fluid chambers and thereby orbitally move said star and rotationally move said outer ring with respect to said star, said valve means comprising

(a) a timing plate fixedly mounted to said outer ring and having a flat face disposed perpendicular to said drive shaft axis and facing opposite from said outer ring, said timing plate further including a plurality of axially directed passageways extending therethrough for selectively communicating with the fluid chambers of said gerotor means, and

(b) a spool mounted within said housing coaxially with



said drive shaft and so as to preclude relative rotation with respect to said housing, said spool having a flat face disposed perpendicular to said drive shaft axis and directly opposing said flat face of said plate, with said timing spool flat face having a first set of openings communicating with said inlet port and a second set of openings communicating with said outlet port, with the openings of both sets selectively communicating with respective ones of the passageways through said timing plate upon relative rotation of said plate and spool, and

linkage means operatively interconnecting said star and said spool for precluding rotation of said star above drive shaft axis while permitting orbital movement of said star,

whereby the flow of pressurized fluid into either one of said inlet port and said outlet port causes said outer ring, said timing plate, and said drive shaft all to rotate about said drive shaft axis, while said star orbits about said axis but is held against rotational movement by said linkage means, and with the fluid exhausting through the other port.

4,457,678

FLUID DRIVE MECHANISM

Mark R. Kinder, Lafayette, Ind., and David S. Moorman, Coal Valley, Ill., assignors to TRW Inc., Cleveland, Ohio

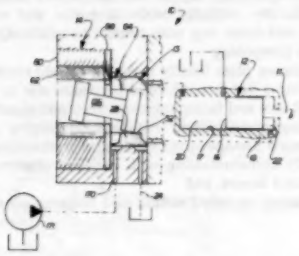
Filed Feb. 24, 1982, Ser. No. 351,966
Int. Cl.³ F03C *2/08*; F16D *31/02*; F15B *15/00*
U.S. Cl. 418—61 B **15 Claims**

1. A mechanism for moving an element in opposite directions, said mechanism comprising

fluid motor means including at least one piston member and one cylinder member defining first and second expansible chambers, said piston member and cylinder member moving in one direction relative to each other when the first chamber is expanded and moving in the opposite direction relative to each other when the second chamber is expanded,

a valve element having a high pressure port through which fluid is directed to the chamber that expands and a low pressure port through which fluid is directed from the chamber that contracts,

a fluid motor operatively connected to said valve element for moving said valve element to alternately communicate said high and low pressure ports with said first and second expansible chambers upon movement of said valve element to effect relative movement of said piston member



and cylinder member in opposite directions, said fluid motor having a fluid inlet for communication with a fluid source and a fluid outlet, and

means defining a fluid conduit for communicating said fluid outlet with said high pressure port of said valve element.

4,457,679

VANE PUMP WITH UNILATERAL BEARING

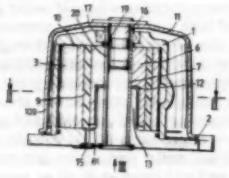
Rolf Warnecke, and Peter Buchholz, both of Gifhorn, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed May 10, 1982, Ser. No. 376,616

Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119230

Int. Cl.³ F04B *17/00, 35/00*

U.S. Cl. 418—91 **14 Claims**



1. In a motor driven vane pump comprising an approximately bell-shaped pump housing having a housing bottom and containing a cylindrical rotor chamber with an intake connection and an outlet connection, said housing bottom forming a chamber bottom of said rotor chamber, a housing cover closing, in a sealed manner, the end of said rotor chamber opposite said chamber bottom, a cylindrical rotor arranged eccentrically in said rotor chamber and having a rotor shaft fixedly connected therewith and having an end passing in a sealed fashion axially through said chamber bottom, sealing vanes distributed along the periphery of said cylindrical rotor, said vanes displaceably mounted in guide slots in said rotor, said sealing vanes being axially sealed against said housing cover and said chamber bottom, and being sealingly urged, in the radial direction, against interior walls of said rotor chamber, the chamber volume formed between each two sealing vanes varying periodically on rotation of said rotor between a minimum volume and a maximum volume, the improvement wherein said housing cover is provided with a hollow cylindrical extension projecting into the interior of said housing at least approximately one half of the axial length of said rotor, said extension projecting into a cylindrical clearance in said rotor, said rotor shaft extending through and being unilaterally supported by said extension, wherein said rotor shaft end passing through said chamber bottom is rigidly connected with a rotationally symmetrical driving bell which surrounds said pump housing with play, such that driving forces acting on the outer periphery of said driving bell in rotating said rotor, are applied in a region of said driving bell surrounding said extension.

4,457,680

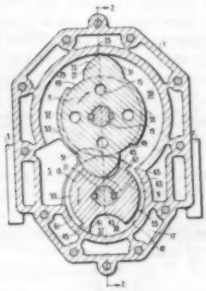
ROTARY COMPRESSOR

Win W. Paget, P.O. Box 1335, Elizabethtown, N.C. 28337

Filed Apr. 27, 1983, Ser. No. 489,045

Int. Cl.³ F04C *1/24;* **F01C** *1/24*

U.S. Cl. 418—191 **3 Claims**



1. In a rotary compressor comprising a casing having an inlet for gas to be compressed, an outlet for compressed gas, a chamber communicating between the inlet and outlet, and in the chamber a female rotor and a male rotor that turn in opposite directions, the chamber having cylindrical side walls concentric with the rotors, the female rotor having at least one pocket therein that receives at least one lobe on the male rotor, the lobe sweeping one of said cylindrical side walls; the improvement comprising a sealing rib on the female rotor on the trailing side of each said at least one pocket, a recess on the male rotor at the rear of each said at least one lobe for receiving the rib, the female rotor having a peripheral surface extending rearwardly from the rib with respect to the direction of rotation of the female rotor, and terminating in a said pocket, said peripheral surface being spaced a substantial distance radially inwardly of the other of said cylindrical side walls of the casing, the rib sweeping said other side wall, said at least one pocket intermittently registering with said outlet upon rotation of said female rotor, said outlet communicating with said chamber and being open for the outflow of compressed gas only when in registry with said at least one pocket and being closed by said female rotor to the outflow of gas when out of registry with said at least one pocket, said cylindrical side walls meeting at an edge, said rib clearing said edge at the start of a compression cycle of said compressor.

4,457,681

VOLUME RATIO CONTROL MEANS FOR AXIAL FLOW HELICAL SCREW TYPE COMPRESSOR

Milton W. Garland, Waynesboro, Pa., assignor to Frick Company, Waynesboro, Pa.

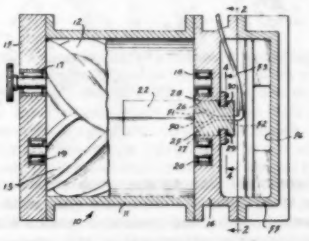
Filed Jun. 16, 1981, Ser. No. 274,132

Int. Cl.³ F01C *1/16;* **F04B** *29/00;* **F15B** *13/044*

U.S. Cl. 418—201 **4 Claims**

1. In a screw compressor having meshing helical rotors on parallel axes and mounted in a housing having intersecting cylindrical bores, a high pressure end wall to one end of said housing and a low pressure end wall at the other end thereof, the low pressure end wall having an inlet opening for the inlet of the compressor and the high pressure end wall having an internal face in alignment with and exposed to the cylindrical

bores and an enclosed discharge area beyond the discharge opening and remote from the internal face of the high pressure end wall, the improvement comprising, a discharge opening in the high pressure end wall, said discharge opening being generally aligned with the flow of fluid being compressed within the compressor, a slide member slidably moveable in said opening so as to be transversely moveable with respect to the axes of the rotors and which in a first position closes said discharge opening to a predetermined minimum and in a second position opens the discharge opening to a predetermined maximum, said slide member being moveable between said positions to provide openings of varying size therebetween, and means for



controlling the position of the slide member, said controlling means including first sensing means for sensing the pressure of the working fluid at the internal face of the high pressure end wall, said first sensing means being positioned in the high pressure end wall so as to be generally axially aligned with the fluid being compressed within the cylindrical bores, second sensing means for sensing the pressure of the working fluid in the discharge area beyond the discharge opening and said slide member, and means for moving said slide member in response to a functional difference between the sensed pressures, whereby the sensed pressures are maintained substantially equal.

4,457,682

MACHINE FOR CASTING CONCRETE MEMBERS

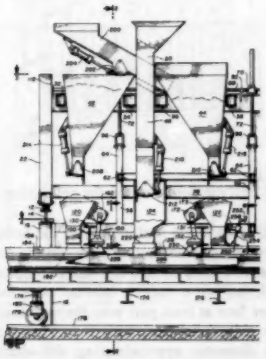
Richard C. Nash, New Prague; David W. Hanson, Golden Valley, and Richard R. Koehn, Prior Lake, all of Minn., assignors to Fabcon, Inc., Savage, Minn.

Division of Ser. No. 257,781, Apr. 27, 1981, Pat. No. 4,369,153. This application Jan. 14, 1983, Ser. No. 458,016

The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.

Int. Cl.³ B29C *11/00*

U.S. Cl. 425—219 **2 Claims**



1. A machine for casting concrete panels on a casting pallet, including a floor and a pair of parallel side walls, said machine comprising:

a frame;

a slipform frame having at least one slipform suspended therefrom above the floor and between the side walls of said casting pallet, each of said slipforms having a pair of side walls and a top surface, each of said slipforms having a core shaping material receiving port located in the top surface thereof between front and rear portions thereof, the front portion of each of said slipforms having a closed bottom, while the remainder of said slipform has an open bottom, said slipform also including a closed extreme front portion in which the side walls and top and bottom surfaces of the said slipform are tapered inwardly to form a markedly reduced cross sectional area closed end;

first concrete delivery means mounted on said frame for depositing slump concrete over the front and extreme front portions of each of said slipforms and said casting pallet and covering at least part of said slipform with concrete;

core material delivery means mounted on said frame for delivering crushed rock or similar core material to said core material receiving port on each of said slipforms to fill the rear portion of said slipform with core material;

second concrete delivery means mounted on said frame for depositing slump concrete over the rear portion of said slipform and completely covering the rear portion of said slipform with concrete;

means for introducing relative longitudinal movement between said casting pallet and said frame while said concrete hopper means deposit concrete over each of said slipforms and said core material delivery means delivers core material to the interior of each of said slipforms to continuously form on said casting pallet a concrete panel having at least one core material filled core in a single continuous machine casting operation;

adjustable primary screed means are suspended from said frame for providing a level top surface on said panel; and

a rear screed suspended from said frame, said rear screed comprising:

pattern plate means aligned parallel to and adjacent with the top surface of said panel and having a series of projections and depressions at varying depths on the surface thereof aligned along the axis of movement between said casting pallet and said frame; and

acutely angled means for plowing connected to the front end of said pattern plate, said means for plowing including a series of projections and depressions aligned with the projections and depressions of said pattern plate with said projection extending forwardly and tapering to a point at the forward end thereof, thereby to facilitate plowing of longitudinal grooves and depressed areas in the surface of said plank corresponding to said projections and depressions.

4,457,683

BELT-TYPE PRESS

Klaus Gerhardt, Rheurdt, and Dieter Goertz, Viersen, both of Fed. Rep. of Germany, assignors to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Mar. 2, 1983, Ser. No. 471,516

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3207627

Int. Cl.³ B29J *5/00*

U.S. Cl. 425—373 **16 Claims**

1. A press for continuously compressing a web, the press comprising:

a drum having a heated outer surface and rotatable about an axis;

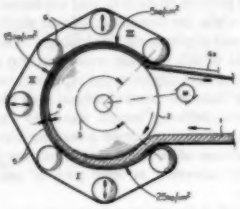
at least one endless belt radially juxtaposed with a portion of the outer drum surface and consisting mainly of

an elastically deformable matrix, and

a plurality of parallel, twisted, and generally annular mul-

tifilament cords axially spaced from one another and formed of yarns of an aromatic polyamide imbedded in the matrix;

means for tensioning the belt and thereby urging it radially toward the drum-surface portion, whereby the belt and the drum-surface portion form an angularly extending pressing region;



means for feeding the web to be compressed tangentially to one end of the pressing region and for withdrawing it from the other end thereof; and

means for rotating the drum and thereby displacing the web and the belt angularly along the portion, whereby the web is compressed against and heated by the drum.

4,457,684

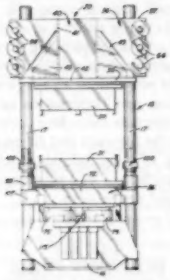
HYDRAULIC PRESS

Martin M. Gram, Minneapolis, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Division of Ser. No. 493,651, May 11, 1983, which is a continuation-in-part of Ser. No. 237,690, Feb. 24, 1981, abandoned. This application Jun. 17, 1983, Ser. No. 505,404

Int. Cl.³ B29F *1/00*

U.S. Cl. 425—451.9 **10 Claims**



1. A press comprising a lower platen, a plurality of elongated columns supported relative to said lower platen, and a movable crosshead mounted for sliding movement along said columns between a working position and a mold open position said crosshead comprising a plurality of substantially parallel webs extending transversely between the two support columns, and said webs being spaced laterally apart so that the support columns fit between at least two of the webs, a clamp mechanism mounted between said webs on at least one end thereof, said clamp mechanism having a bore therethrough adapted to receive a column and being slotted in direction generally parallel to the elongated length of the column, and means to clamp the webs and the clamp mechanism positioned therebetween against the column by compressing the slot to releasably locate the crossheads on such column.

4,457,685

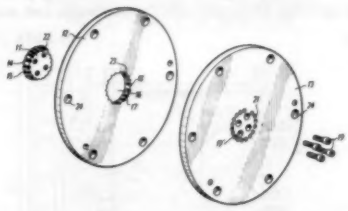
EXTRUSION DIE FOR SHAPED EXTRUDATE

Yun-Yang Huang, Voorhees, and Edward J. Rosinski, Pedricktown, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 4, 1982, Ser. No. 336,741

Int. Cl.³ A01J *21/00*

U.S. Cl. 425—461 **6 Claims**



1. An extrusion die apparatus which comprises an outer plate and an inner plate, said inner plate adapted to be in mating engagement and in fixed concentric relation with a centrally located opening in said outer plate, said inner and outer plates being further characterized by having contacting mating edge surfaces which define, when in mating engagement and in concentric relation, at least one orifice, said inner and outer plates having radial lug means and mating female channel means whereby the mating of said lug with said channel aligns said inner and outer plates causing said orifice to be formed in a predetermined shape and location.

4,457,686

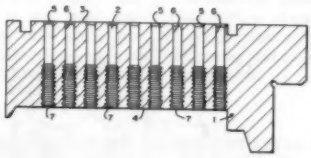
PELLET EXTRUSION DIE

Thomas J. Rowland, Sydney, Australia, assignor to Ingersol-Rand Company, Woodcliff Lake, N.J.

Filed Mar. 21, 1983, Ser. No. 477,260

Int. Cl.³ B29F *3/04*

U.S. Cl. 425—463 **10 Claims**



1. A pellet mill die construction for pelletizing solid material comprising:

a die member having a multiplicity of die holes constituting extrusion passages extending between the inner and outer faces thereof, each of said die holes comprising

a bore hole having a smooth internal bore extending from said inner face at least part way through said die hole and

a multiple ridged internal bore having an equal effective internal diameter approximating the diameter of said smooth bore extending from and in axial alignment with said smooth bore towards said outer face.

4,457,687

MOULD FOR THE MANUFACTURE OF SEMI-ELBOWS OF THERMALLY INSULATING MATERIAL FOR PIPES

Francesco Valbonesi, Milan, Italy, assignor to Isoring S.r.l., Milan, Italy

Filed Apr. 11, 1983, Ser. No. 483,731
Int. Cl.³ B29C 17/00
U.S. Cl. 425—394 3 Claims

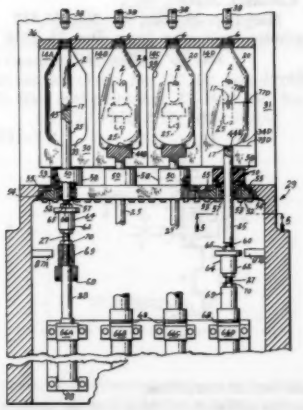
1. Mould for the manufacture of a thermally insulating semi-elbow for pipes, the semi-elbow being formed from mineral fibres bonded by a polymerisable resin characterized in that it consists of an upper support plate carrying the male mould parts and a lower support plate carrying the female mould parts, the upper and lower plate being hinged to one another, the female mould parts presenting a peripheral flanged portion and an annular abutment portion extending upwardly from said peripheral flanged portion, the male mould parts presenting an L-profiled flanged portion mating with said annular abutment portion and fixed to the outside surface of the upper plate, the latter abutting against said annular abutment portion of the female mould parts, said peripheral flange of the female mould portion and the L-profiled flange of the male mould portion being operable to center, respectively, the male portion in the upper support plate and the female portion in the lower support plate, the male and female mould parts defining therebetween a mould annular chamber extending for 360° about a central axis so as to define a semi-elbow, the mould parts being provided with holes or apertures for blowing overheated air into the mould chamber to produce a moulded shaped product from the mixture of mineral fibres and a polymerisable resin when placed in the mould chamber.

4,457,688

EXTERNAL CENTER PIN FOR BLOW MOLDING MACHINE

James W. Calvert, and Samuel Belcher, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 261,663, May 7, 1981, abandoned. This application Feb. 3, 1982, Ser. No. 345,246
Int. Cl.³ B29C 17/07
U.S. Cl. 425—525 17 Claims



1. In a machine for making a plastic bottle of resin by blow molding within a blow mold assembly an elongated hollow tubular preform which is shorter than said bottle and that has one end open and the other end closed, the blow mold assembly being openable and comprising at least one mold which is openable and which assembles to form along a substantially vertical axis a cavity shaped substantially like the bottle and providing for expansion of the preform along said axis and in a radial direction substantially normal thereto, called the hoop direction, the open end of the preform being held substantially on said axis by suspension of the preform with its closed end down from a neck ring which also cooperates with the blow mold assembly to seal the neck end of the cavity, the machine also having a blow ring means for entering the open end of the preform and directing blowing fluid into the preform to form a bottle by expanding same into engagement with the mold walls defining said cavity, there being no mandrel or core supporting the preform nor any mechanical element that enters the preform to engage the interior bottom portion thereof, the improvement that comprises

a center pin movably supported in the bottle bottom of said cavity;

an upwardly facing shaped upper face on said center pin for engaging the closed end of said preform and contoured at its periphery to form with said mold at the bottom of said mold cavity a bottle bottom molding surface;

support means coupled to an end of and supporting said center pin for reciprocable motion in the direction of said axis while keeping said pin located substantially on said axis;

means disposed beneath said center pin and support means and coupled to said support means for reciprocating said support means and center pin on said axis as aforesaid said center pin, support means, and means for reciprocating being so arranged that said shaped upper face moves between a first lower position where said shaped upper face is in register with adjacent mold cavity surfaces to define at least a part of the bottle bottom and a second upper position along said axis toward said open end where said shaped upper face is spaced apart from the closed end of the preform and is engagable during blowing by the preform; and

said means for reciprocating further including means to drive said center pin and support means between said first and second positions and to bias said center pin in a direction opposite to movement from said second to said first position with a force insufficient to resist expansion of said preform once it comes into contact with said shaped upper face during blowing of said bottle.

4,457,689

INJECTION STRETCHING BLOW MOLDING MACHINE

Katashi Aoki, 6037 Ohazaminamijo, Sakakimachi, Hanishina-gun, Nagano-ken, Japan

Filed Jan. 28, 1982, Ser. No. 343,394
Claims priority, application Japan, Feb. 3, 1981, 56-14601
Int. Cl.³ B29C 17/07
U.S. Cl. 425—525 7 Claims

1. An injection, stretching and blow molding machine for parisons, comprising:

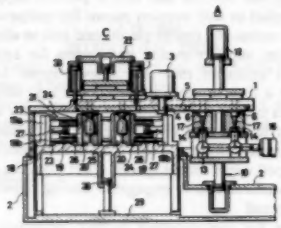
a horizontal machine bed; a base plate supported spaced above and parallel to the machine bed; a rotary disk supported by the base plate; a plurality of pairs of neck molds, each pair of neck molds being located along a respective radius of said disk with one neck mold of the pair being located radially inward of and spaced from the remaining neck mold of the pair, each radius being spaced apart from the adjacent radii by a predetermined angle, each neck mold being supported by the disk and adapted to hold at least one parison such that said parisons extend beneath the neck mold and beneath the disk; drive means connected with the disk for rotating the disk, at spaced intervals, with respect to the base plate, said drive means rotat-

ing the disk by angles corresponding to said predetermined angle;

at spaced locations on the machine, there being defined, in the following sequence, around the disk, and located stationary with respect to the rotating disk, the following stages, each stage being so located that it is adjacent a respective pair of neck molds when the disk is stopped by the drive means:

(a) an injection molding stage comprising: a pair of injection molds aligned axially of the disk; a mold closing mechanism at the machine bed; the injection molds being all supported on the closing mechanism, first moving means for moving the mold closing mechanisi for moving the injection molds up to move the neck molds into the injection molds and for moving the injection molds down, away from the neck molds;

(b) a temperature control stage, comprising: a pair of temperature control members, each for cooperating with at least one parison which has been formed in a respective one of the injection molds; a second moving means for raising the temperature control members up toward the disk and the parisons located at the temperature control stage and for moving the temperature control members down away from the disk and the parisons located at the temperatyre control stage;



(c) a stretching and blow molding stage, comprising: a blow mold device, including a pair of blow molds for respective groups of parisons located at the stretching and blow molding stage, said blow molds forming said parisons into respective molded objects; third moving means for moving the blow mold device in the axial direction of the disk up toward the disk and the parisons located at the blow molding stage and down away from the disk not to a position not to interfere with transportation of said molded objects; the blow mold device including a mold opening and closing mechanism for opening and closing the blow molds along the radial direction of the disk a distance which is slightly greater than the diameter of said molded objects when the blow mold device has been moved up by the third moving means; and

(d) a molded product release stage, including release means for contacting the respective neck molds at the release stage for opening the neck molds for releasing said molded objects held by the neck molds; fourth moving means for moving the release means from a position up and above the disk and neck molds to a position down and toward the disk for causing the release means for opening the neck molds;

at least the third moving means being separate from the first and second moving means for moving independently with respect to one another.

4,457,690

PULSE BURNERS

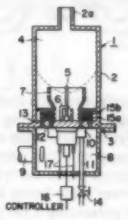
Toshihiko Saito, and Fusao Hirasawa, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 20, 1982, Ser. No. 451,420

Claims priority, application Japan, Dec. 25, 1981, 56-193797[U]

Int. Cl.³ F23C *11/04*

U.S. Cl. 431—1 **6 Claims**



1. A pulse burner comprising:

a combustion cylinder provided with an ignition plug;

a fuel inlet passage for supplying fuel into said combustion cylinder;

an air inlet passage for supplying combustion air into said combustion cylinder;

flapper valve means operated by pressure variations caused by an explosive combustion of an air-fuel mixture in said combustion cylinder and exhaust of combustion product therefrom, whereby the flapper valve means repeatedly opens and closes the fuel inlet passage and the air inlet passage;

flame confining means disposed in said combustion cylinder to confine therein a portion of the combustion product; and

a flame detector positioned in said flame confining means for detecting flame in accordance with electric current flowing through said flame.

4,457,691

PULSE BURNERS

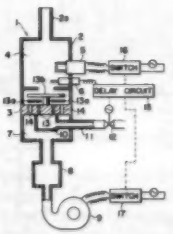
Satoshi Hisaoka, Fujinomiya, and Toshihiko Saito, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 20, 1982, Ser. No. 451,422

Claims priority, application Japan, Dec. 25, 1981, 193798

Int. Cl.³ F23C *11/04*

U.S. Cl. 431—1 **3 Claims**



1. A pulse burner comprising:

a combustion cylinder provided with an ignition plug;

a fuel inlet passage for supplying fuel into said combustion cylinder;

an air inlet passage connected to a fan for supplying combustion air into said combustion cylinder;

flapper valve means operated by pressure variations caused by explosion in said combustion cylinder and exhaust of combustion product therefrom, whereby the flapper valve means repeatedly opens and closes the fuel inlet passage and the air inlet passage; and

a flame detector installed in said combustion cylinder for stopping operations of the ignition plug and the fan once the combustion has started normally.

4,457,692

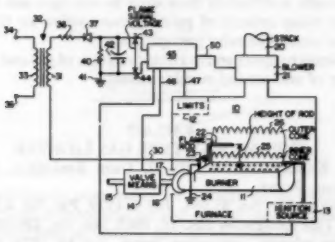
DUAL FIRING RATE FLAME SENSING SYSTEM

John L. Erdman, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 22, 1983, Ser. No. 525,082

Int. Cl.³ F23N *3/00*

U.S. Cl. 431—19 **10 Claims**



1. A flame sensing system adapted to control a fuel burner in a furnace which includes a fuel supply means to vary a supply of fuel between a low flow rate and a high flow rate, and air source means adapted to vary a supply of combustion air to the burner between a high flow rate and a low flow rate, including: a flame rod positioned to be in an outer area of a flame present at said burner when said burner is in operation; flame sensing circuit means adapted to be energized by a source of voltage; and said flame sensing circuit means connected to said flame rod and said burner to provide a flame rectified sensing signal that varies with the rate of fuel being burned and connected to said fuel supply means and said air source means to control said fuel supply means and said air source means between said high flow rates and said low flow rates.

4,457,693

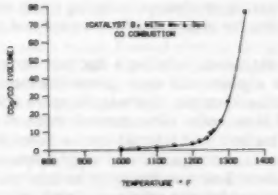
COMBUSTION PROCESS

Dwight L. McKay, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 117,927, Feb. 4, 1980, Pat. No. 4,335,021. This application Apr. 23, 1982, Ser. No. 371,369

Int. Cl.³ F23Q *3/00*; B01J *29/06*

U.S. Cl. 431—2 **14 Claims**



1. A process for combusting carbonaceous fuel and a free oxygen containing gas, which process comprises:

(a) passing into contact with a catalyst said carbonaceous fuel, which is separate from and not adhering to said catalyst and said free oxygen containing gas, said catalyst containing both manganese and antimony,

(b) subjecting the mixture of said catalyst, said separate carbonaceous fuel and said free oxygen containing gas to combustion conditions,

(c) withdrawing an off-gas from said mixture having a high CO_2/CO ratio.

4,457,694

AUTOMATIC AIR-FUEL RATIO CONTROL APPARATUS

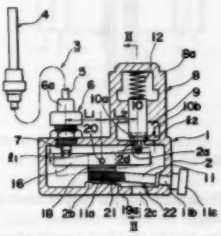
Yasunori Maeda, and Hiroshi Nakagaki, both of Nara, Japan, assignors to Chugai Ro Kogyo Co., Ltd., Osaka, Japan

Filed Apr. 1, 1982, Ser. No. 364,214

Claims priority, application Japan, Apr. 4, 1981, 56-50966

Int. Cl.³ F23N *1/02*

U.S. Cl. 431—90 **6 Claims**



5. An improved combustion mixture control apparatus for regulating the delivery of air and fuel, in a predetermined ratio, to a combustion chamber comprising:

control means for varying the flow of fuel to the combustion chamber;

monitor means for monitoring the temperature of the combustion air being delivered to the combustion chamber and producing a correlated mechanical displacement to a displaceable member that moves in dependence on the temperature measured;

means, connected to respectively the displaceable member of the monitor means and to the control means, for varying the control means in response to movement of the displaceable member; and

adjustment means for selectively varying the effective mechanical displacement of the displaceable member to change the applicable air-fuel ratio, including a pivotable lever member, a bearing member having a pivot point for pivotably supporting the lever member and a support member having a slanting surface that displaces the pivot point relative to the displaceable member and the control means when the bearing member is moved relative to the support member, with the displaceable member positioned to exert force at generally one end of the pivotable lever member and the control means being responsive to movement of generally the other end of the pivotable lever member.

4,457,695

BURNER FOR THE COMBUSTION OF POWDERY FUELS

Joachim Kümmel, Türkisweg 4, D-4044 Kaarst, Fed. Rep. of Germany

Filed Feb. 5, 1982, Ser. No. 346,158

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1981, 3104054; European Pat. Off., Oct. 8, 1981, 81108054.8

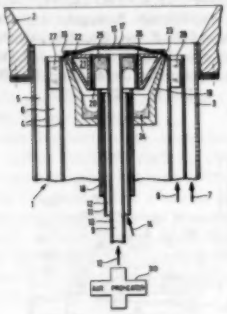
Int. Cl.³ F23D *11/04*

U.S. Cl. 431—168 **13 Claims**

1. A burner employing core air and secondary air for the combustion of powdery fuels, comprising:

(a) a core air supply duct;

(b) a fuel supply channel mounted about said core air supply duct;
(c) a secondary air supply duct mounted about said fuel supply channel;
(d) a generally frusto-conical bowl mounted about said fuel supply channel and spaced from said secondary air duct;
(e) a generally frusto-conical body mounted to said core air supply duct and spaced from said bowl for forming an annular gap fuel discharge nozzle therewith;



(f) means for rotatably supporting at least one of said bowl and said body;
(g) means connected to said fuel supply channel for directing said powdery fuel therethrough; and,
(h) core air redirecting means disposed adjacent the outlet of said nozzle and said body and forming an annular gap with said body for radially outwardly directing core air through said gap into fuel issuing from said nozzle outlet for directing said fuel into a secondary air stream issuing from said secondary air supply duct.

4,457,696

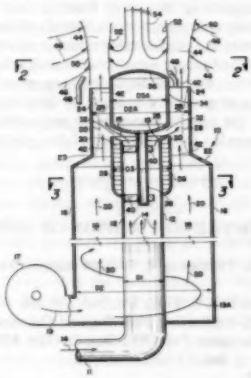
LARGE CAPACITY AIR-POWERED SMOKELESS FLARE

Robert E. Schwartz; Roger K. Noble, and Michael R. Keller, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Continuation of Ser. No. 78,646, Sep. 24, 1980, abandoned. This application Sep. 8, 1981, Ser. No. 300,175

Int. Cl.³ F23D *13/20*

U.S. Cl. 431—202 **7 Claims**



1. A flare for smokeless combustion of vented waste gases, comprising;
(a) an inner vertical first conduit of diameter D1, for the upward flow of waste gases for burning, said first conduit having an open top;
(b) an outer vertical second conduit of diameter D2 larger than D1, substantially coaxial with said first conduit, and extending to a top which is above the top of the first conduit, said second conduit forming a substantially enclosed chamber thereabout having a first annular passage between the two conduits, the bottom of the second conduit connected with an air mover means through which primary combustion air is forced at greater than atmospheric pressure by said air mover means;
(c) closed cylindrical obstacle means of diameter D3A greater than D1, but less than D2, supported axially above the top of said first conduit by a selected distance, and extending upward to at least the top of said second conduit, forming a second annular passage above said first annular passage between said obstacle means and said second conduit;
whereby said waste gas flowing from the top of said first conduit is deflected outwardly to intersect and mix with the rising column of primary combustion air flowing in said second annular passage; and
(d) means to ignite and burn said mixture of gas and air at the top of said second annular passage.

4,457,697

THROWAWAY TYPE GAS LIGHTER

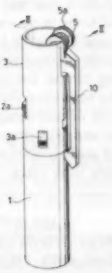
Seiichi Kitabayashi, No. 919-12, Oaza Koshikiya, Ageo-shi, Saitama, Japan

Division of Ser. No. 55,954, Jul. 9, 1979, Pat. No. 4,325,692. This application Jan. 15, 1982, Ser. No. 339,321

Claims priority, application Japan, Jul. 19, 1978, 53-98295; Nov. 10, 1978, 53-154079; Feb. 8, 1979, 54-14430; Mar. 29, 1979, 54-39956

Int. Cl.³ F23Q *1/04*

U.S. Cl. 431—254 **4 Claims**



1. A throwaway type gas lighter comprising:
a windbreak;
a fuel tank for receiving a liquified fuel gas and including a supply pipe leading therefrom;
a spark generating mechanism including a rasp wheel, a flint and a spring for urging said flint toward said rasp wheel; and
fuel supplying means including a disc member mounted on said tank adjacent said spark generating mechanism and into which said supply pipe is implanted; a injection pipe received in an outer valve member made of a softened flexible material and inserted into a hole of said disc, closed on its end adjacent said supply pipe and formed with a lateral hole terminating in an inlet end normally disposed in confronting relationship with said outer valve member to seal against flow from said supply pipe to the interim of said fuel injection pipe; an arm plate connected between said spark generating mechanism and said injection pipe and means pivotally mounting said spark gener-

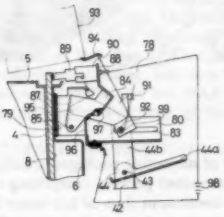
ating means on said fuel tank so that in operation the arm plate is arranged to push the free end of said injection pipe away from its normal position to space said inlet end away from said disc to enable fuel to flow from said supply pipe into said injection pipe.

4,457,698

OIL BURNER

Kenji Shibata, Ashikaga, and Noboru Takahashi, Sano, both of Japan, assignors to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of Tokyo, Japan

Filed May 11, 1982, Ser. No. 376,955
Claims priority, application Japan, Jun. 26, 1981, 56-99911
Int. Cl.³ F23D *3/32*; F23Q *7/08*
U.S. Cl. 431—254 **8 Claims**



1. An oil burner comprising: an oil tank; an air introduction cylinder; a wick extending around said air introduction cylinder and movable upwardly and downwardly; a cylindrical wick support affixed to an outer periphery of said wick; a crank bearing plate attached to said wick support; a crank held in engagement with said crank bearing plate for moving said wick upwardly and downwardly; a shaft support base secured to said oil tank at an exterior thereof; a wick control shaft having one end rotatably supported on said shaft support base and the other end projecting into said oil tank and mounting thereon said crank; a wick lifting lever pivotably supported on said shaft suppot base for angular movement about a pivot and having a controlling end movable downwardly for rotating said wick control shaft in a direction to lift said wick; an ignition lever actuatable in ganged relation to said wick lifting lever; ignition mechanism acting in response to the operation of said ignition lever and having an ignition heater for igniting said wick; and a return spring for returning said wick lifting lever.

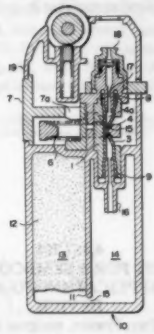
4,457,699

VALVE MEANS FOR GAS LIGHTER

Tadamichi Hattori, Yokohama, Japan, assignor to Tokai Seiki Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 213,907, Dec. 8, 1980, abandoned. This application Jun. 16, 1983, Ser. No. 504,084
Claims priority, application Japan, Dec. 10, 1979, 54-160045
Int. Cl.³ F23D *13/04*
U.S. Cl. 431—344 **7 Claims**

1. A valve means for use in a gas lighter having a gas tank to be filled with liquefied fuel gas, an ignition means located on the gas tank, and a nozzle located close to the ignition means for spouting the fuel gas from the gas tank in front of the ignition means, said valve means comprising a valve conduit connected between the gas tank and the nozzle for making communication therebetween, said valve conduit being made of elastic material and capable of closing its flow path formed therein by operation from outside, a pressing member movable between a closing position to effect upon the valve conduit to close its flow path and an opening position to release the valve conduit to allow the conduit to recover its original form to open the flow path due to its elasticity, means integral with said pressing member for forcing the valve conduit to open when said pressing member is in said opening position, said pressing member comprising a pressing portion for pressing the valve conduit against a fixed face to close the conduit, a valve retaining portion for receiving the valve conduit when the conduit is pressed and closed, and a valve conduit opening portion located adjacent the valve retaining portion for forcing



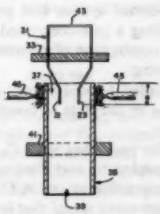
the valve conduit to open, said valve conduit opening portion comprising a pair of walls having a space therebetween slightly smaller than the outer diameter of the valve conduit, and a manually operable actuating lever operable from outside for moving said pressing member between said closing position and said opening position.

4,457,700

ELECTRICALLY-ACTIVATED PHOTOFLASH LAMP EXCLUDING A PRESS-SEALED END PORTION

Andre C. Bouchard, Peabody; Harold H. Hall, Jr., Marblehead, and Frederick A. Loughridge, Ipswich, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 170,509, Jul. 20, 1980, Pat. No. 4,369,556. This application Sep. 28, 1982, Ser. No. 426,024
Int. Cl.³ F21K *5/02*
U.S. Cl. 431—362 **24 Claims**



1. An electrically-activated photoflash lamp comprising:
a hermetically sealed, light-transmitting glass envelope having first and second opposing sealed end portions, neither of said end portions being a press seal, said first sealed end portion including a longitudinal groove therein;
a quantity of filamentary combustible material located within said envelope for providing a high intensity flash of light upon ignition thereof;
a combustion-supporting gas within said envelope; and
ignition means disposed within said envelope for igniting said filamentary combustible material, said ignition means including a pair of spaced-apart electrical conductors and a quantity of primer material, each of said conductors sealed within said first end portion and located within and along the deepest portion of said groove, said conductors each including a termination portion void of glass material

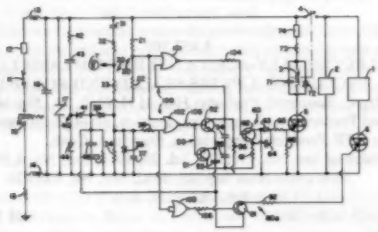
and having access to the interior of said envelope, said termination portions being substantially flush with the internal surface of said first end portion, said primer material occupying said groove and in contact with both of said termination portions of said conductors so as to bridge said conductors, said photoflash lamp not including a glass bead or similar member in contact with said electrical conductors.

4,457,701

CONTROL CIRCUIT FOR A SEMI-CONDUCTOR POWER ELEMENT AND APPLICATION TO A BURNER SAFETY DEVICE

Albert Gaiffier, Le Puy, France, assignor to Constructions Electriques R.V., Brives Charensac, France

Filed May 12, 1982, Ser. No. 377,364
Claims priority, application France, May 12, 1981, 81 09808
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—24 12 Claims



1. A fail-safe control system that produces a gate control signal for controlling a gate-controlled device in dependence upon the state of combustion of a burner having a combustion chamber, comprising:

first means coupled to said burner for providing a signal representative of the state of combustion in said combustion chamber;

second means for providing an A.C. supply signal;

third means coupled to said first means and said second means and responsive to said A.C. supply signal for providing a square-wave signal that is synchronous with said A.C. supply signal;

fourth means coupled to said third means and said first means and responsive to said state signal and to said synchronous square-wave signal for providing a first control signal only where said synchronous square-wave signal and said state signal are simultaneously present;

fifth means coupled to said third and said fourth means and responsive to said synchronous square-wave signal and to said first control signal for providing a second control signal only where said synchronous square-wave signal and said first control signal are simultaneously present; and

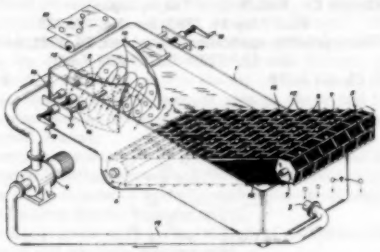
sixth means coupled to said fifth means and said controlled device and responsive to said second control signal for producing said gate control signal that actuates said gate-controlled device only where said second control signal is present.

4,457,702

METHOD OF TEMPORARILY IMMERSING ARTICLES IN A HOT-WATER BATH

Sergio Marchetti, Via Ottoboni, 10, Milano, Italy

Division of Ser. No. 267,755, May 28, 1981, Pat. No. 4,384,849.
This application Feb. 11, 1982, Ser. No. 347,979
Claims priority, application Italy, Jul. 7, 1980, 23276 A/80; Oct. 8, 1980, 25193 A/80
Int. Cl.³ F27D *3/00*; C12C *3/04*
U.S. Cl. 432—11 2 Claims



1. A method of subjecting packaged articles to a heat treatment for predetermined periods, comprising the steps of:

generating a continuous flow of hot water between an inlet end and a remote outlet end of an upwardly open vessel by way of an external conduit interconnecting said ends;

depositing articles to be treated in said vessel at a predetermined location near said inlet end for entrainment by the flow toward said outlet end;

intercepting the entrained articles ahead of said outlet end by a continuously operating conveyor partly immersed in said flow for removal of the articles from the vessel; and

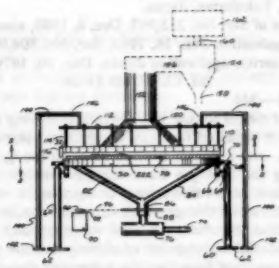
imparting turbulence to the flow at said inlet end with creation of a vortex descending at said predetermined location for insuring full submersion of the articles deposited in said vessel.

4,457,703

APPARATUS AND A PROCESS FOR HEATING A MATERIAL

Donald R. Ross, P.O. Box 11388, Fort Worth, Tex. 76110

Continuation-in-part of Ser. No. 127,451, Mar. 5, 1980, which is a division of Ser. No. 787,713, Apr. 14, 1977, Pat. No. 4,263,163.
This application Aug. 9, 1982, Ser. No. 406,705
Int. Cl.³ F27B *9/16*, *15/00*; F23D *13/12*
U.S. Cl. 432—13 121 Claims



1. A furnace for heating a first subject to form a heated first subject, said furnace comprising:

a. a first heating material having a first heating surface;

b. a second heating material having a second heating surface;

c. said first heating material and said second heating material

being in an opposed relation and spaced apart to allow said first subject to be positioned between them;

d. the distance between said first heating material and said second heating material may be as small as one quarter of an inch;

e. a first means to introduce a mixture of air and fuel below said first heating material and to rise through said first heating material, to have combustion of said fuel to occur above said first heating surface and below said second heating surface; and,

f. said first heating material being porous to allow said mixture to rise upwardly and pass through it, and being an insulator to preclude combustion of said mixture below it.

4,457,704

METHOD FOR THE OPERATION OF A GAS BURNER EXPOSED TO AN AIR CURRENT AS WELL AS BURNERS TO IMPLEMENT THE METHOD

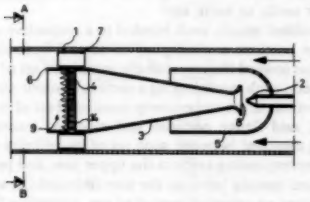
Hans Sommers, Essen; Hans Berg, Gladbeck, and Theo Jannemann, Dorsten, all of Fed. Rep. of Germany, assignors to Ruhrgas Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Apr. 2, 1982, Ser. No. 364,879

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1981, 3113416

Int. Cl.³ F24H *1/00*; F23D *11/44, 13/24*

U.S. Cl. 432—29 **25 Claims**



1. A method for operating a gas burner having at least one fuel gas nozzle, at least one mixing pipe, and a burner plate, all serially arranged in a air duct, formed as a tubular housing, said method comprising the steps of:

directing a fuel gas jet from the nozzle into the mixing pipe inlet so as to entrain ambient air into the mixing pipe for supplying combustion air thereto by the impulse effect of the gas jet;

guiding an air current substantially in one flow direction through the air duct so as to expose the gas burner to the air current;

diverting, at a point downstream with respect to the mixing pipe inlet, from the air current a combustion air volume larger than the air volume needed for complete combustion of the fuel gas, directing the diverted air volume laterally with respect to the flow direction of the air current and sucking the diverted air volume into the mixing pipe inlet, and the diverting, directing and sucking steps all being provided only by the impulse effect of the gas jet;

providing a combustion gas by mixing in the mixing pipe the diverted air volume with the fuel gas from the nozzle;

supplying the combustion gas to and passing it through passages in the burner plate;

generating a flame zone immediately downstream of the burner plate, with the flames in the flame zone providing waste gases of combustion for heating the air current;

combining and mixing the waste gases of combustion downstream of the flame zone with the remaining portion of the air current flowing through the duct; and

selecting the profiles of the air current flowing around the burner through the duct so that the pressure adjacent the mixing pipe inlet and the pressure adjacent the waste gas outlet downstream of the flame zone are substantially equal throughout a wide range of flow of the air current.

4,457,705

CALCINING SYSTEM FOR THE MANUFACTURE OF CEMENT CLINKER AND THE LIKE

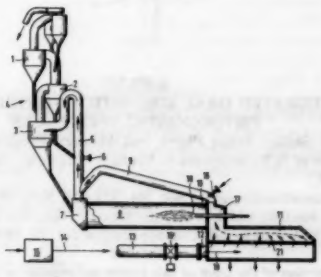
Hubert Ramesohl, Bergisch-Gladbach, and Horst Herchenbach, Hennef, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Aug. 31, 1982, Ser. No. 413,258

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1981, 3134798

Int. Cl.³ F27B *7/02*; F27D *7/00, 15/02*

U.S. Cl. 432—106 **10 Claims**



1. A calcining system for the manufacture of cement clinker and the like comprising:

a preheater,

means for introducing raw material to be calcined into said preheater,

a rotary kiln,

means for transporting preheated material from said preheater into said rotary kiln,

a cooler,

means connecting the discharge of said rotary kiln to said cooler, and

heater means operatively associated directly with said cooler to bring said cooler up to operating temperatures during start-up.

4,457,706

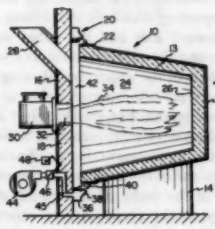
LADLE STATION SEAL

Harry P. Finke; John W. Morgan, II, both of Pittsburgh, and Lee G. Poe, Bethel Park, all of Pa., assignors to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Filed Aug. 2, 1982, Ser. No. 404,552

Int. Cl.³ F24J *3/00*; C21B *7/04*

U.S. Cl. 432—226 **7 Claims**



1. A cold air ladle preheat station including a refractory lined firing wall having a burner extending therethrough, a

ladle adapted to be juxtapositioned with respect to the wall so as to form a gap between a ladle lip and the wall and permit firing into a ladle interior, an air seal supply duct having a shape adapted to be in substantial conformity to said ladle lip, positioned about said firing wall and perimetrically dimensioned slightly larger than the ladle lip, an insulating refractory positioned so as to extend along an inner edge of the air seal supply duct, said duct including a plurality of spaced nozzles directed inwardly in a converging mode so as to direct air toward a perimeter of said ladle lip and form an air curtain across said gap to prevent air infiltration.

4,457,707

INTEGRATED ORAL MAGNETIC OSTEOGENIC AND ORTHODONTIC APPLIANCES

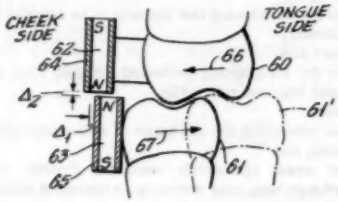
Harry Smiley, White Plains, and Abraham Blechman, Tappan, both of N.Y., assignors to Medical Magnetics, Inc., Ramsey, N.J.

Continuation-in-part of Ser. No. 322,423, Nov. 18, 1981, Pat. No. 4,424,030, which is a continuation of Ser. No. 19,427, Mar. 12, 1979, abandoned. This application Jul. 22, 1983, Ser. No. 516,201

The portion of the term of this patent subsequent to Jan. 3, 2001, has been disclaimed.

Int. Cl.³ A61C 7/00

U.S. Cl. 433—18 6 Claims



1. An oral osteogenic and orthodontic appliance in which at least two magnets are adapted to be mounted by archwires to the upper and lower jaws so that magnetic fields will be displaced relative to each other to promote osteogenesis and soft-tissue repair, said appliance including at least two dental modules, each module comprising a permanent bar magnet retained within a peripherally continuous shield of electrically conductive material so as to expose the magnet only at its poles, whereby flux concentration on the magnet axis is enhanced at the poles of each magnet, tooth-connected maxillary and mandibular archwires for supporting the dental modules, one module-supporting archwire supporting a first module on a vertically oriented axis and the other module-supporting archwire supporting the other module on a vertically oriented axis, the lower pole of the upper module magnet and the upper pole of the lower module magnet being in substantially opposed and closely spaced but axially offset adjacency for the jaw-closed condition; whereby, reaction between said magnets develops a tooth-displacement force effective to displace at least one tooth in one of the jaws and to thereby develop a void in the one jaw in the wake of such tooth displacement, and further whereby, in the course of jaw articulation, the magnetic fields of said magnets react to produce in the developing-void region an external field which varies as a function of jaw articulation, said external field being therapeutically beneficial as an aid to formation of new bone in the void region.

4,457,708

MANDIBULAR STABILIZER

Gerald Dufour, 2935 Longchamp St., Ste-Foy, Quebec G1W 2G2, Canada

Filed Apr. 19, 1982, Ser. No. 369,608

Claims priority, application Canada, Feb. 8, 1982, 395721

Int. Cl.³ A61C 7/00

U.S. Cl. 433—6 22 Claims

1. An orthopedic appliance for relieving maxillo-mandibular imbalance, comprising:

a flexible, preformed structure having an arcuate first portion adapted to extend along and be adjacent to the surface of the mandibular teeth, and two flange portions each integrally connected to a respective end section of the first portion and adapted to overlie the tops of a respective set of either the mandibular premolar teeth or the mandibular molar teeth, or both, and

two moulded inserts, each bonded to a respective one of the flange portions and adapted to extend from that flange portion toward the respectively associated set of mandibular teeth, each insert having a surface contour corresponding to that on the respectively associated set of mandibular teeth, said flange portions and moulded inserts, in use, being disposed between such set of mandibular teeth and the corresponding teeth in the upper jaw, and providing a selected spacing between the mandible and the upper jaw, and, over an extended period of use, providing for stabilization and normalization of the position of the mandible relative to the upper jaw.

4,457,709

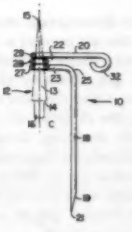
HOLDING DEVICE FOR A DENTAL DOWEL PIN

Charles E. Moore, 420 Magazine St., Tupelo, Miss. 38801

Filed Mar. 9, 1983, Ser. No. 473,595

Int. Cl.³ A61C 19/00

U.S. Cl. 433—74 6 Claims



1. A dental holding device for holding an elongated tapered dowel pin of conical geometry in a secured position suspended above a cavity of a dental impression when making a positive replica of a tooth from such cavity comprising: an elongated wire rod of unitary construction having a lower straight section with a pointed end which is adapted to be inserted into the impression material adjacent the cavity, an intermediate section including a straight portion and a wire coil, with said wire

coil having at least two turns for engaging the tapered body of the dowel pin with the central axis of the wire coil substantially aligned in parallel with said lower straight section and an upper section extending from said wire coil in a direction substantially transverse to said lower straight section and being angularly displaced from said straight portion of said intermediate section to form an included angle therewith of from about 50 to about 85 degrees such that by squeezing and releasing the upper section relative to said straight portion the dowel pin may be inserted and releasably locked in position within said wire coil.

4,457,710

DENTAL INSTRUMENT

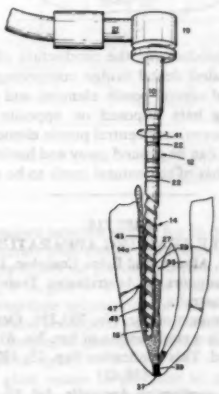
John T. McSpadden, Johnson City, Tenn., assignor to Inventive Technology International, Johnson City, Tenn.

Continuation-in-part of Ser. No. 63,436, Aug. 3, 1979, Pat. No. 4,299,571, Ser. No. 263,406, May 14, 1981, Pat. No. 4,332,561, and Ser. No. 297,007, Aug. 27, 1981, Pat. No. 4,353,698, which is a continuation of Ser. No. 105,761, Dec. 29, 1979, abandoned, which is a continuation-in-part of Ser. No. 970,464, Dec. 18, 1978, abandoned. This application Nov. 9, 1981, Ser. No. 319,266

The portion of the term of this patent subsequent to Oct. 12, 1999, has been disclaimed.

Int. Cl.³ A61C *5/02*

U.S. Cl. 433—81 **7 Claims**



1. An instrument for use with a dental hand piece for thermomechanically obturating a root canal with a thermoplastic material by a process wherein the thermoplastic material is softened by the mechanical working of the thermoplastic material effected by the rotative action of the instrument at a speed of less than about 6,000 r.p.m. and the softened thermoplastic material is distributed in the root canal by the rotational movement of the instrument, said instrument comprising an elongated member having a shank at one end thereof which includes a fitting for engagement with the chuck of a dental handpiece; a working portion at the other end of said member, the diameter of said working portion progressively decreasing away from said shank portion to provide a tapered working portion, flute means on said working portion defining a pair of opposed, continuous spiral flutes, each having a shoulder facing away from said shank and making an angle with the longitudinal axis of said working portion of from about 90° to about 80°, and each of said continuous spiraled flutes making from about 1.0 to about 3.5 spirals per millimeter along the longitudinal axis of said working portion.

4,457,711

PRESSURIZED ORAL SPRAYING DEVICE

Holly H. Maloney, and Albert L. Maloney, both of 16 Rue Grand Vallee, Newport Beach, Calif. 92660

Continuation-in-part of Ser. No. 149,002, May 12, 1980, abandoned. This application Apr. 5, 1982, Ser. No. 365,505

Int. Cl.³ A61C *1/10*

U.S. Cl. 433—82 **2 Claims**

1. An oral hygienic device comprising:

a container of internally pressurized gaseous material having an oral hygienic material therein so that when said gaseous and hygienic material are released, they will form an orally hygienic spray by said gaseous material driving said oral hygienic material therefrom;

an opening within said container;

a valve operatively implaced within said opening for controlling the release of the internally pressurized spray from said container;

a cap attached to said valve in connected relationship thereto for passage of spray when said valve is opened by said cap;

a resilient concave member formed of silicon rubber having arcuate peripheral upstanding walls terminating at respective points along the outer periphery surrounding the concavity and attached to said cap with an opening connecting to said valve for receiving hygienic material therefrom when said valve is opened; and,

a plurality of ribs extending from the peripheral upstanding walls inwardly toward the center of said concave member having upper surfaces capable of being exposed for scrubbing purposes in conjunction with said peripheral upstanding walls, said ribs being spaced sufficiently to allow them to resiliently flex into the spaces between them while at the same time permitting the release of spray from between said ribs and of a sufficient softness to allow the concave member to substantially flatten when implaced against a user's teeth, and wherein said plurality of ribs project from the termination points of said peripheral walls.

4,457,712

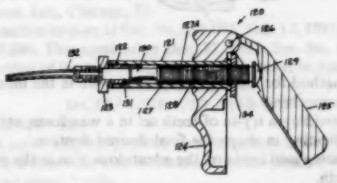
DENTAL SYRINGE

William B. Dragan, 85 Burr Street, Easton, Conn. 06430

Continuation-in-part of Ser. No. 93,059, Nov. 13, 1979, abandoned. This application Apr. 6, 1981, Ser. No. 251,278

Int. Cl.³ A61C *5/04*

U.S. Cl. 433—90 **4 Claims**



1. A dental syringe for the placement of a root canal filling material in a root canal of a tooth and for effecting a controlled

extrusion of a predetermined amount of said root canal material comprising:

an elongated tubular barrel having an open front and an open rear end,

a reservoir fitting means detachably connected to the front end of said barrel, said reservoir fitting means including a chamber for receiving a supply of root canal material to be extruded, said chamber extending into said barrel,

said chamber having a discharge opening extending forward of said barrel,

an elongated needle connected to said discharge opening, and having a bore extending therethrough so as to be in communication with said chamber, said needle being sized so as to be received in the root canal of a tooth,

a plunger reciprocally mounted in said barrel, said plunger including a stem portion and a connected piston head, said piston head being adapted to be snugly received in said chamber as the plunger is axially displaced within said barrel toward said chamber,

said plunger stem extending beyond the rear end of said barrel,

a handle means,

said handle means including a first handle member fixedly connected to said barrel adjacent the rear end thereof,

a second handle member pivotally connected to said fixed handle member, said second handle member being adapted to bear on said plunger to effect the displacement thereof when said second handle member is squeezed toward said first fixed handle member, whereby a mechanical advantage is exerted by said second handle member on said plunger by the application of a nominal squeezing force on said handle member,

said plunger stem portion being externally threaded,

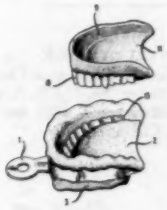
and an adjustable stop disk threaded on said stem portion, said stop disk being adjustably mounted on said stem portion extending between said handle members whereby said stop disk can be readily adjusted simultaneously with the squeezing of said handle members to effect a controlled extrusion of said root canal material, whereby said stop disk can be variably adjusted along any predetermined length of said threaded portion of said stem to control the amount of extrusion accordingly.

4,457,713

DENTURE FORMING METHOD

Sidney Schneider, 576 Sussex Ave., Morristown, N.J. 07960

Filed Sep. 29, 1982, Ser. No. 427,020
Int. Cl.³ A61C *13/22*
U.S. Cl. 433—171 9 Claims



1. A method for forming a denture in-situ in the mouth of a patient comprising:

(A) providing a try-in of teeth set in a wax form, said try-in duplicating in shape the final desired denture,

(B) placing said try-in on the edentulous gum in the patient's mouth,

(C) with said try-in in place, forming an impression of same in alginate held in a tray,

(D) removing said tray, alginate, and try-in from the mouth and placement of the teeth from said try-in in the tooth impressions formed in the alginate,

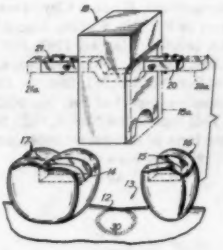
(E) coating the exposed alginate impression and exposed roots of the teeth protruding above the alginate with curable liquid resins and forming said acrylic resin to the desired shape by implacing said tray with alginate, teeth and liquid acrylic resin in the patient's mouth until the acrylic has cured.

4,457,714

DENTAL BRIDGE AND METHOD OF DENTAL BRIDGE FABRICATION

Warren Z. Klein, 1137 E. 5th St., Brooklyn, N.Y. 11230

Filed Mar. 18, 1982, Ser. No. 359,519
Int. Cl.³ A61C *13/22*
U.S. Cl. 433—180 14 Claims



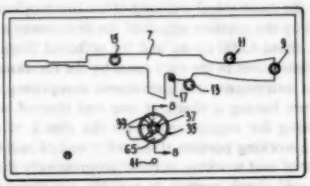
1. A starting product for the production of an integrally formed prefabricated dental bridge comprising an oversized vertically-oriented central pontic element, and a pair of horizontally-extending bars disposed on opposite sides of said central pontic element, said central pontic element being made of material which can be ground away and having a configuration larger than that of the natural tooth to be replaced.

4,457,715

RIFLE TRAINING APPARATUS

Lindsay C. Knight, Albury, and Brian Compton, Lavington, both of Australia, assignors to Australasian Training Aids, Pty. Ltd., Albury, Australia

Continuation-in-part of Ser. No. 733,331, Oct. 18, 1976, abandoned, which is a continuation of Ser. No. 617,145, Sep. 26, 1975, abandoned. This application Sep. 21, 1977, Ser. No. 835,431
Claims priority, application Australia, Jul. 10, 1975, 82919
Int. Cl.³ F41F *27/00*; F41G *3/26*
U.S. Cl. 434—22 83 Claims



1. Apparatus for training in the use of of a firearm, comprising:

a firearm;

at least one transducer means positioned relative to the firearm and coupled for providing a signal representing pressure applied to the firearm;

circuit means responsive to said transducer signal for controlling a display means, the circuit means defining a transducer signal range corresponding to a predetermined optimal range of pressure applied to the firearm; and

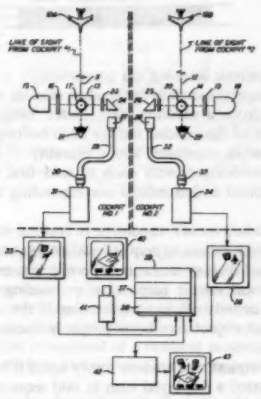
display means responsive to said circuit means for providing an indication when the pressure applied to the firearm at said transducer means is within said predetermined optimal range.

4,457,716

PERFORMANCE MONITOR SYSTEM FOR AIRCRAFT SIMULATOR

Eldon D. Eserhaut, Lancaster, Calif.; Donald E. Gutridge; Ray F. McNally, both of Phoenix, Ariz., and Adolph P. Stumpf, Litchfield Park, Ariz., assignors to The Singer Company, Binghamton, N.Y.

Filed Jul. 15, 1981, Ser. No. 283,411
Int. Cl.³ G09B *9/08*
U.S. Cl. 434—43 **9 Claims**



1. A performance monitor system for an optical sight display in a fighter aircraft pilot training simulator, comprising:

visual display means for providing a pictorial representation, including a target, to a trainee pilot's line-of-sight in a view of real-time information in said training simulator;

projector means, positioned out of said trainee pilot's line-of-sight, to project a gunsight reticle toward said trainee pilot's line-of-sight;

combining glass means to produce to said trainee pilot a view of said pictorial representations as seen through said gunsight reticle;

an electronic camera means positioned remotely relative to said trainee pilot's line-of-sight;

optical means located out of a trainee's normal field-of-view so that said view as seen by said trainee pilot through said projected gunsight reticle is visible to both said trainee pilot and to said remotely positioned electronic camera means;

said optical means includes prism lens means located in a predetermined relationship relative to said combining glass means to produce a duplicate view of said view as seen by said trainee pilot through said gunsight reticle;

bundles of flexible fiber-optic means to convey said duplicate image of said trainee pilot's view to said remotely positioned electronic camera means;

camera pick-up lens means positioned between said prism lens means and one end of said bundles of fiber-optic means;

relay lens means positioned between the opposite end of said bundles of fiber-optic means that from said one end and said remotely positioned electronic camera means; and

means to adjust the physical position of said optical means relative to said combining glass means to locate and to orient said prism lens means in a predetermined manner relative to said combining glass means;

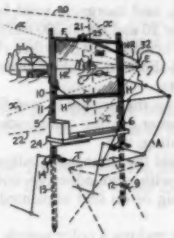
whereby electrical signals generated by said electronic camera means are available to produce a duplicate pictorial representation for monitoring the performance of a trainee pilot and so that an instructor can see the same view that the trainee pilot sees through the gunsight reticle.

4,457,717

APPARATUS TO HELP LEARNING PICTORIAL ART

John J. Chika, 1350 Orchard Ridge Rd., Bloomfield Hills, Mich. 48013

Filed Apr. 5, 1982, Ser. No. 365,557
Int. Cl.³ G09B *11/06*
U.S. Cl. 434—88 **23 Claims**



1. An apparatus to aid in learning and practicing the art of realistic free-hand sketching, drawing and other pictorial arts comprising:

a panel of specifically configured, relatively thin and transparent material (P) temporarily attached to and supported by relatively more rigid transparent panel (B) framed by a rigid frame assembly (F) if desired,

adjustable apparatus to position and maintain said rigid frame (F) or panel (B) at the desired proximity in front of its sitting or standing user (A),

auxiliary head-rest (means) (HR) to adjustably establish and maintain the desired distance between its user's eye point (E) and the surface of said transparent panel (P) if desired.

said head-rest (HR) having its length telescopically adjustable, its extendible end (32) adapted to harmlessly rest against its user's forehead, its other end adjustably securable at the desired location to said frame (F) or said rigid panel (B) in a manner permitting the desired angular adjustability and securement of it thereto, and

specifically configured marking, drawing or painting materials (C) enabling said sitting or standing user to mark, sketch, draw or paint on the facing surface of said transparent panel (P) whatever is visible through it.

4,457,718

COLOR DISPLAY PRODUCT

Stanley Lerner, Highland Park, Ill., assignor to Color Communications, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 233,843, Feb. 12, 1981, Pat. No. 4,379,696. This application Dec. 17, 1982, Ser. No. 450,690
The portion of the term of this patent subsequent to Apr. 5, 2000, has been disclaimed.
Int. Cl.³ G09F *7/00*; A44B *7/00*
U.S. Cl. 434—98 **40 Claims**

1. A color display product consisting essentially of a polypropylene film base with a thickness in the range of from about 2 mils to about 7 mils,

said polypropylene film base having at least one surface coated with an interpolymer coating composition comprising an interpolymer as the film forming agent of (a)

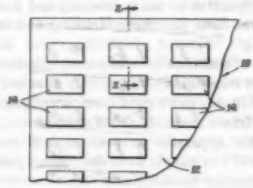
from about 2.5 to about 6 parts by weight of an alpha-beta monoethylenically unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, and mixtures thereof, and (b) from about 97.5 to about 94 parts by weight of neutral monomer esters, said neutral monomer esters comprising (1) methyl acrylate or ethyl acrylate and (2) methyl methacrylate, said interpolymer comprising from about 30 percent to about 55 percent by weight of methyl methacrylate when said alkyl acrylate is methyl acrylate, and from bout 52.5 percent to about 69 percent by weight of methyl methacrylate when said alkyl acrylate is ethyl acrylate, said interpolymer coating being further characterized as containing (1) from about 30 percent to about 60 percent by weight based upon the total weight of said interpolymer, of a hot slip agent consisting of a finely divided, water insoluble, inorganic solid selected from the group consisting of silica, diatomaceous earth, calcium silicate, bentonite and finely divided clays, said inorganic solid having a particle size between about 10 and about 200 millimicrons, and (2) said interpolymer coating being further characterized by containing a cold-slip, anti-blocking material comprising finely-divided wax;

a paint coating on the surface of said film base coated with said interpolymer coating composition;

an adhesive coating; and

a mount base, said film base being adhesively affixed to said mount base with said adhesive coating being on said painted coating or on said unpainted surface of said film base.

7. A method for making a color sample display device comprising:



providing a sheet of polypropylene having a thickness in the range of from about 2 mils to about 7 mils;

said polypropylene sheet having at least one surface coated with an interpolymer coating composition comprising an interpolymer as the film forming agent of (a) from about 2.5 to about 6 parts by weight of an alpha-beta monoethylenically unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, and mixtures thereof, and (b) from about 97.5 to about 94 parts by weight of neutral monomer esters, said neutral monomer esters comprising (1) methyl acrylate or ethyl acrylate and (2) methyl methacrylate, said interpolymer comprising from about 30 percent to about 55 percent by weight of methyl methacrylate when said alkyl acrylate is methyl acrylate, and from about 52.5 percent to about 69 percent by weight of methyl methacrylate when said alkyl acrylate is ethyl acrylate, said interpolymer coating being further characterized as containing (1) from about 30 percent to about 60 percent by weight based upon the total weight of said interpolymer, of a hot slip agent consisting of a finely-divided, water insoluble, inorganic solid selected from the group consisting of silica, diatomaceous earth, calcium silicate, bentonite and finely-divided clays, said inorganic solid having a particle size between about 10 and about 200 millimicrons, and (2) said interpolymer coating being further characterized by containing a cold-slip, anti-blocking material comprising finely-divided wax;

coating the surface of said sheet coated with said interpolymer coating composition with a paint coating; and

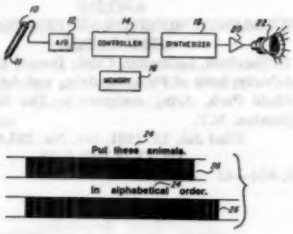
adhesively affixing said sheet to a mount base.

4,457,719

ELECTRONIC LEARNING AID FOR PROVIDING SEQUENCING AND SPELLING EXERCISES

Ashok Dittakavi, and Barbara J. Thompson, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 25, 1982, Ser. No. 382,009
Int. Cl.³ G09B 5/06
U.S. Cl. 434—159 **11 Claims**



1. An electronic learning aid comprising:

a student operable means for reading student selected coded indicia from a medium, said coded indicia incuding a plurality of first coded indicia each corresponding to an initialization command and a plurality of second coded indicia associated with each of said first coded indicia each second coded indicia corresponding to a displayed item;

an initialization means responsive to reading student selected first coded indicia to request said student to arrange said associated display items in a specific sequence;

a comparison means responsive to reading of a specific second coded indicia to determine if the corresponding displayed object has been properly located in said sequence;

means to request said student to try again if he has improperly located a displayed item in said sequence; and

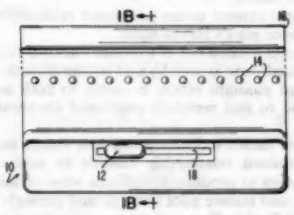
a speech synthesis means for speaking one or more words of human language to effect said requests to said student.

4,457,720

READING PACER

Gary W. Spong, Vallejo, Calif., assignor to Banatron Research Corp., Inc., San Jose, Calif.

Filed Jul. 23, 1982, Ser. No. 401,072
Int. Cl.³ G09B 17/04
U.S. Cl. 434—179 **4 Claims**



1. A reading pacer comprising a portable, hand-holdable housing having visible indication means along one edge thereof, said visible indication means being arranged to provide a visible output which can move along said edge in a given direction at a predetermined speed, and driver means within said housing for controllably causing said visible indication means to provide said visible output which moves along said edge at said predetermined speed, said driver means com-

prising an energy source and an electronic circuit within said housing, said visible indication means comprising a row of lamps mounted in said housing, said electronic circuit being arranged to energize said lamps in sequence, said electronic circuit also containing means for controlling the speed by which said lamps are energized in sequence, and means for controlling the number of lamps in said row which are energized in every cycle of sequential energization of said lamps, said means comprising a switch having a plurality of different settings for respectively different column widths of line printing.

4,457,721

CONSTRUCTION KIT FOR ELECTRICAL CIRCUITS

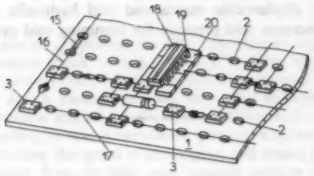
Patrice Charvolin, 3 rue Tupin, 69002 Lyon Rhone, France

Filed Sep. 14, 1981, Ser. No. 301,792

Claims priority, application France, Sep. 12, 1980, 80 19964

Int. Cl.³ G09B *23/18*; H01R *29/00*

U.S. Cl. 434—224 **29 Claims**



1. A junction piece for use in conjunction with a kit apparatus for the construction of electrical circuits wherein said kit apparatus comprises a plate having a plurality of apertures arranged in a predetermined pattern therein and at least one electronic component, said junction piece comprising:

a head portion comprised of a resilient material and having an upper surface and a lower surface opposite said upper surface;

a first resilient lug formed integrally with said lower surface of said head portion and extending away therefrom;

a second resilient lug formed integrally with said head portion and extending from said lower surface away therefrom in a spaced relationship with said first resilient lug, said first and second resilient lugs being selectively inserted together into at least one aperture of said plurality of apertures and being resiliently biased by a portion of said plate disposed around said at least one aperture such as to removably secure said junction piece to said plate; and

selectively operable electrical interconnection means on said head portion for electrical interconnection with said at least one electronic component.

4,457,722

EDUCATIONAL TOY FOR DEVELOPING MANUAL DEXTERITY

Nancy C. Housand, 630 S. Kenton St., Urbana, Ohio 43078

Filed Aug. 11, 1983, Ser. No. 522,075

Int. Cl.³ G09B *19/24*

U.S. Cl. 434—260 **11 Claims**

1. An educational toy comprising:

a board-like base,

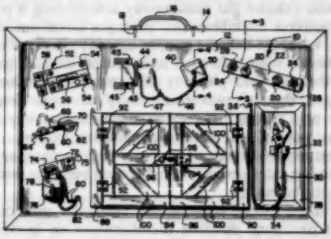
a plurality of conventional locks mounted on said base in a manner permitting locking and unlocking manipulation of the components thereof,

a plurality of conventional fasteners mounted on said base,

a plurality of tools engagable with said fasteners to permit fastening and unfastening manipulation of said fasteners by said tools, means for connecting said tools to said base,

door means,

hinge means attaching said door means to said base while permitting pivoting movement of said door means between a closed position overlying said base and opened positions projecting outwardly from said base, and



at least one of said conventional locks being operable to secure said door means in said closed position thereof.

4,457,723

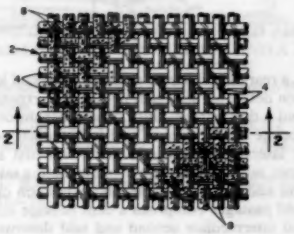
COLOR CHANGEABLE FABRIC

Clarence R. Tate, Fairfield, Ill., assignor to Thalatta, Inc., Fairfield, Ill.

Filed Jun. 11, 1981, Ser. No. 272,531

Int. Cl.³ B43L *1/00*; D03D *15/02*

U.S. Cl. 434—409 **12 Claims**



1. A fabric comprising hollow transparent filaments bound together, said filaments containing a transparent liquid having rotatable color-coded micromagnets dispersed therein.

4,457,724

APPARATUS FOR DRIVING A SURFBOARD

Yasuhiko Miyamoto, Ohmiya, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1981, Ser. No. 281,254

Claims priority, application Japan, Dec. 27, 1980, 55-187181; Dec. 27, 1980, 55-187183; Dec. 27, 1980, 55-187186; Dec. 27, 1980, 55-187188

Int. Cl.³ B63H *1/04*

U.S. Cl. 440—38 **13 Claims**

1. An apparatus for driving a surfboard comprising

a box mounted on a rear portion of said surfboard,

said surfboard defines an outlet part on the bottom of said surfboard,

an internal combustion engine mounted on said box, a crankshaft of said internal combustion engine being vertically inserted into said box, said internal combustion engine has an exhaust port,

said box defines therein an exhaust gas passageway communicating with said exhaust port of said internal combustion engine and with said outlet port of said surfboard,

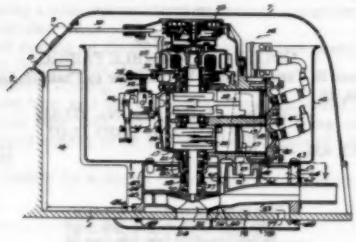
a water jet propelling device disposed in said box, said water jet propelling device having an impeller secured to said crankshaft,

said box defines a jet nozzle communicating with said impeller and a cooling water system for said internal combustion engine,

said box comprises superimposed cases having partitions therein, said cases and said partitions dividing said box into said exhaust gas passageway constituting a plurality of expansion chambers and passages communicating in series, with said exhaust gas passageway arranged in three dimensions with reference to a central exhaust gas flow path through said plurality of expansion chambers and passages, thereby preventing entry of water from said outlet port through the exhaust gas passageway to said exhaust port of said internal combustion engine,

said superimposed cases comprise a bottom case; an upper case and an intermediate case disposed between said upper and bottom cases,

said partitions extend substantially vertically and constitute lateral partitions defining therebetween an intermediate second of said expansion chambers and a longitudinal of said partitions,



said box, a rear of said lateral partitions and said longitudinal partition define an upstream first of said expansion chambers and a downstream third of said expansion chambers on opposite lateral sides of said longitudinal partition,

said rear lateral partition is formed with first and second apertures, said first aperture communicating said upstream first and said intermediate second expansion chambers,

one of said passages comprises a bent passage communicating said intermediate second and said downstream third expansion chambers via said second aperture and an exit opening of said bent passage, respectively, and

another of said passages comprises a bottom laterally extending horizontal passage in said bottom case communicating with said outlet port formed in the bottom of said surfboard at the rear thereof immediately below said jet nozzle, and

a vertical of said passages extends through said intermediate case to said bottom case, communicating with said downstream third expansion chamber at an upper entrance opening of said vertical passage and with said bottom laterally extending horizontal passage, respectively.

4,457,725

HYDRAULIC TRIM TILE SYSTEM FOR OUTBOARD PROPULSION UNITS USING A PRESSURE AMPLIFIER

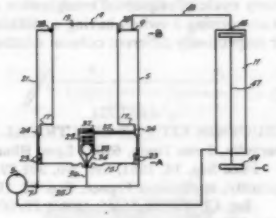
Calvin V. Kern, 629 Brahier La., Maumee, Ohio 43537, and Lawrence P. Zepp, 230 Liberty St., Bowling Green, Ohio 43402

Continuation of Ser. No. 70,378, Aug. 27, 1979, abandoned. This application Aug. 17, 1981, Ser. No. 293,766

Int. Cl.³ B63H *21/26*

U.S. Cl. 440—61 **13 Claims**

1. A system for trimming and tilting an outboard propulsion unit having a hydraulic means for developing hydraulic pressure, displaceable means connected to said hydraulic means for trimming and tilting said propulsion unit in response to said hydraulic pressure, means for amplifying said pressure connected to said displaceable means and said hydraulic means, said amplifier means having a first and a second port, said first port being connected to said hydraulic means, said amplifier means including switch means within said amplifier means, and responsive to a pressure differential for bypassing said amplifier means and connecting said hydraulic means to said displaceable means substantially without amplification for tilting



said propulsion unit substantially without increased pressure and said switch means connecting said amplifier means between said displaceable means and said hydraulic pressure means to increase said pressure for trimming said propulsion unit.

4,457,726

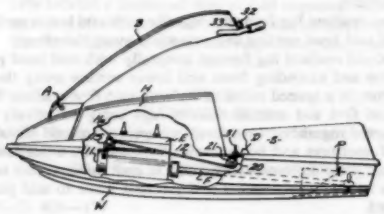
SMALL WATERCRAFT STARTING ARRANGEMENT

Clayton J. Jacobson, P.O. Box 5338, Empire Landing RB, Parker, Ariz. 85344

Filed Jun. 8, 1981, Ser. No. 271,519

Int. Cl.³ F02N *3/02*

U.S. Cl. 440—85 **1 Claim**



1. In a waterborne vehicle of the type having a control handle horizontally articulated for controlling the direction of travel of said vehicle, said control handle being pivotally mounted on a substantially horizontal pivot at the forward end of said vehicle and aligned to extend to the free end thereof in a vertical arc about said pivot to a point rearward of said forward end to an alignment substantially central above said vehicle and an internal combustion engine mounted in said vehicle in substantial alignment below said point for propelling the vehicle through water, the improvement comprising:

engagement means releasably connected between said free end of said handle and said engine for applying turning moments to said engine upon the pivotal articulation of said handle;

said engagement means including a spring-loaded recoil starting reel mounted on said engine for storing a length of starting rope thereon engaged to said engine; and

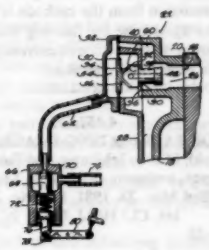
guide means for directing said rope towards the free end of said handle including turning rollers deployed in said vehicle for guiding said starting rope.

4,457,727

MARINE PROPULSION DEVICE ENGINE COOLING SYSTEM

John D. Flaig, Libertyville, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 2, 1981, Ser. No. 269,640
Int. Cl.³ B63H 21/26
U.S. Cl. 440—88 12 Claims



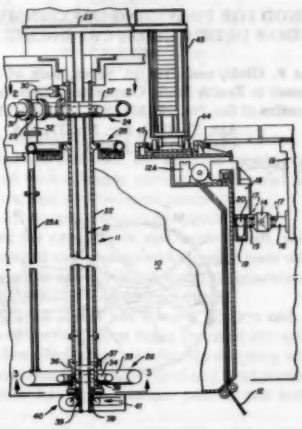
12. A marine propulsion device comprising an engine including an engine block having a coolant conduit having an upstream coolant conduit portion, a downstream coolant conduit portion, and a passage portion extending between said upstream portion and said downstream portion and including an outlet leading to said downstream portion, a movable throttle for controlling the speed of the engine, and means for controlling coolant flow through said passage portion including a valve member movable relative to and selectively engageable with said outlet to control coolant flow through said passage portion in response to throttle movement and independently of temperature, and thermostatic means for varying the coolant flow through said passage portion in response to temperature variation and independently of valve member movement relative to said outlet.

4,457,728

STORAGE TRANSFER AND PRODUCTION MARINE PLATFORM

Robert L. Brown, 27594 Parkview Blvd., Warren, Mich. 48092

Filed May 17, 1982, Ser. No. 378,740
Int. Cl.³ B63B 27/34
U.S. Cl. 441—4 5 Claims



1. In a floating marine terminal the combination of a closed cylindrical structure having an annular revolvable ring thereon, a plurality of buoyant tanks arranged around said cylindrical structure, movable means connecting said tanks and said revolvable ring and means forming a central vertical passageway through said closed cylindrical structure, a platform on said closed cylindrical structure, a well production shaft extending through said passageway and communicating with said platform, a plurality of vertically spaced circular manifolds about said passageway, at least two of said circular manifolds consisting of radially spaced inner and outer members, a plurality of four-way valves on said outer member of the uppermost one of said circular manifolds and communicating therewith, with said inner member thereof and with one of said circular manifolds therebelow, circumferentially spaced tubes connecting said last mentioned circular manifold with the outer circular member of the other one of said two circular manifolds having radially spaced inner and outer members and means connecting said last mentioned outer circular member to the inner circular member of said other one of said two circular members having radially spaced inner and outer members, a chamber formed around said passageway adjacent the lower portion of said closed cylindrical structure and means communicating with said last mentioned inner circular member and said chamber, said chamber arranged to be placed in communication with lines extending from said floating marine terminal to shore, flexible lines on said closed cylindrical structure in communication with said four-way valves and arranged for communication with ships secured to said bouyant tanks of said floating marine terminal.

4,457,729

POLYOLEFIN LAYER WITH IMPROVED ADHESION TO A FOAMED PLASTIC SUBSTRATE AND A METHOD FOR ITS MANUFACTURE

Erik R. Peerlkamp, Born, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Aug. 31, 1981, Ser. No. 298,252
Claims priority, application Netherlands, Aug. 30, 1980, 8004959
Int. Cl.³ B29D 27/04; A63C 15/00; B32B 5/20, 27.32
U.S. Cl. 441—74 9 Claims

1. A rotational molding process for manufacturing objects having a foamed plastic substrate adhered to a polyolefin coating layer, and having improved adhesion therebetween comprising the combination of steps of:

(a) preparing a first outer coating layer of a stabilized polyolefin by rotational molding wherein a stabilized powdered polyolefin is introduced into a heated rotational mold and during said rotational molding said mold is heated to a temperature above the melting point of said stabilized polyolefin;

(b) forming a second inner layer of an at most slightly stabilized polyolefin contiguous with and on the interior surface of said first outer layer by rotational molding wherein an at most slightly stabilized powdered polyolefin is introduced into said rotational mold subsequent to the formation of said first outer coating layer of the stabilized polyolefin while said mold is heated; and thereafter

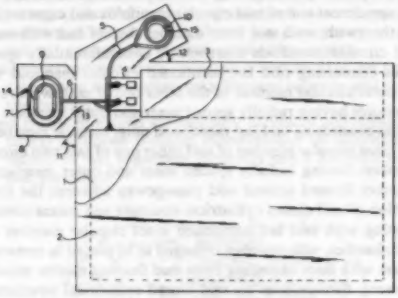
(c) introducing a foamable plastic material onto the interior surface of the thus formed second layer in said mold and foaming said plastic thereagainst whereby the foamed plastic is bonded to said interior surface.

7. A surf board manufactured according to claims 1, 4 or 5.

4,457,730
VACUUM PACKAGED INFLATABLE FLOTATION DEVICE

Gordon T. Foster, La Habra, and Joseph A. Mukievicz, Lake Forest, both of Calif., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Jul. 20, 1981, Ser. No. 285,027
Int. Cl.³ B63C 9/12
U.S. Cl. 441—94 **9 Claims**

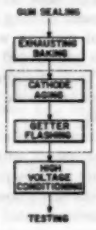


1. A vacuum packed inflatable flotation assembly comprising:
- an inflatable flotation device;
- means for inflating said inflatable flotation device including a container holding an inflating medium;
- actuation means for triggering inflation of said inflatable flotation device with said inflating medium;
- a sealed, flexible vacuum bag containing said inflatable flotation device, said container, and said actuation means, said bag including a neck portion extending therefrom;
- a pull handle positioned within said neck portion, said pull handle including a hand hole extending therethrough;
- a weld within said neck portion forming a closed loop within said hand hole;
- an opening within said weld and extending through said neck portion; and
- connecting means connecting said pull handle to said actuation means.

4,457,731
CATHODE RAY TUBE PROCESSING

David J. Patrickson; John D. Webster, both of Seneca Falls, and Edward Schwartz, Auburn, all of N.Y., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 28, 1982, Ser. No. 425,351
Int. Cl.³ H01J 9/50, 9/44
U.S. Cl. 445—2 **3 Claims**

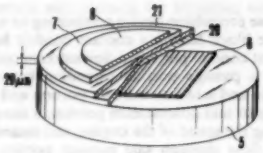


1. A method of processing a cathode ray tube which has been previously gettered by the flashing of a barium containing material therein and, thus, has a barium film on portions of its internal surface, and which has been regunned by removing the original gun from the neck of the tube and then sealing therein a replacement gun having a cathode, a plurality of mutually spaced grid electrodes and a barium-containing getter extending from one of the electrodes, said method including baking and exhausting the tube to a pre-flash vacuum, then sealing the evacuated tube to form a closed vessel, and the improvement comprising the steps of:
- aging the tube including heating the cathode and drawing a current therefrom to at least one grid electrode, so that the electron emission from the cathode is stabilized, and then
- gettering the aged tube by flashing the barium-containing getter therein, whereby the occurrence of a dark-centered cathode is substantially avoided.

4,457,732
METHOD OF FABRICATING IMAGE PICKUP TUBES

Saburo Nobutoki; Mitsuo Ichikawa, and Takeo Sawaguchi, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,601
Int. Cl.³ H01J 31/26, 9/20
U.S. Cl. 445—35 **4 Claims**

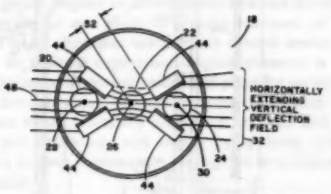


1. In a method for production of an image pickup tube having a face plate structure wherein on a face plate of the tube, a color separation stripe-shaped filter, an adhesive layer and a transparent glass sheet are laminated in this order, a method of fabricating the face plate structure comprising the steps of:
- adhering a transparent drawn glass sheet material having a thickness of about 40 to 80 microns to the color separation stripe-shaped filter on the face plate; and
- forming an optically polished surface on a top of the adhered drawn glass sheet while reducing the distance between the top and the stripe filter surface to about 40 microns or less.

4,457,733
METHOD FOR PROVIDING COEXTENSIVE RASTER PATTERNS IN TELEVISION CRT IN-LINE ELECTRON GUNS

Norman F. Gioia, and Fred H. Scher, both of Lombard, Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Continuation of Ser. No. 191,581, Sep. 29, 1980. This application Apr. 27, 1982, Ser. No. 372,406
Int. Cl.³ H01J 29/51, 29/76
U.S. Cl. 445—36 **2 Claims**



1. A method for establishing coextensiveness in the composite raster pattern developed by a television cathode ray tube having a viewing screen and an in-line electron gun assembly, which gun issues three coplanar electron beams comprising a

center beam coincident with the tube axis and two off-axis beams flanking said center beam,

said beams being subject to horizontal and vertical deflection fields for developing a composite raster pattern on said screen in which the contribution to said composite pattern by said center beam, absent magnetic field enhancing, is diminished in vertical height so as to be non-coextensive with the patterns developed by the two off-axis flanking beams,

said method comprising the following steps:

(A) embracing each said off-axis beam at a point subsequent to its issuance from said gun with a pair of discrete, spaced apart, inwardly converging but non-intersecting, magnetic field enhancing members;

(B) disposing said paired members in a symmetrical relationship to define an opening between the extremities thereof that confronts said center beam;

(C) orienting each enhancing member at a predetermined converging angle with respect to the plane of the three beam paths; and

(D) positioning each of said enhancing members at a predetermined lateral distance from said tube axis,

so that said so-arranged enhancing members effectively divert components of the horizontal flux of said vertical deflection field through said defined openings and across the path of said center beam to enhance the height of the pattern developed by said center beam and establish coextensiveness with the patterns developed by the said off-axis beams.

4,457,734

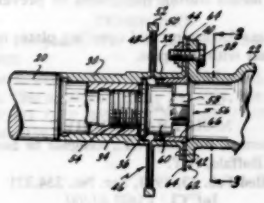
FAIL-SAFE IMPROVEMENT FOR A FLEXIBLE SHAFT COUPLING

Edwin E. Cohen, Venice, Calif., assignor to Hughes Helicopters, Inc., Culver City, Calif.

Filed Nov. 9, 1981, Ser. No. 319,187

Int. Cl.³ F16D 3/10, 3/79

U.S. Cl. 464—30 **4 Claims**



1. An improvement in a flexible coupling having a first member coupled to a first shaft, and a second member coupled to a second shaft with a flexible portion coupling said first and second members, said improvement comprising:

plug means for coupling to said first shaft; and

socket means for coupling to said second shaft, said plug means arranged and configured to loosely mate with said socket means in a first condition and to securely engage said socket means in a second condition;

wherein said plug means has a screw portion and a head portion, said screw portion being threaded into said shaft and said first member of said flexible coupling being secured to said first shaft by means of said head portion, said head portion having a shoulder portion and bolt head portion;

whereby when said flexible coupling fails said second condition obtains and said plug and socket means securely engage each other such that said first and second shafts continue to drive.

4,457,735

GEAR TYPE COUPLING WITH OVERLOAD PROTECTION

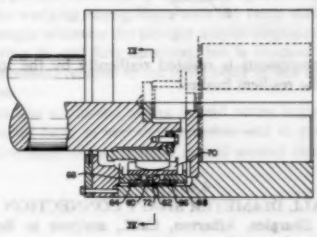
Kenneth K. Carman, Ellicott City, and Stanley G. Webb, Severna Park, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 952,628, Oct. 19, 1978, abandoned. This application Jan. 9, 1981, Ser. No. 223,613

The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.

Int. Cl.³ F16D 3/18, 9/00

U.S. Cl. 464—32 **4 Claims**



1. In a gear type coupling comprising a floating shaft, hub means fixed to said floating shaft at each end thereof, said hub means having a plurality of outwardly extending gear teeth formed thereon, and sleeve means having an inner axial bore operably connected to a driving shaft and a driven shaft, said inner axial bore of said sleeve means having a plurality of inwardly extending gear teeth, said hub means and sleeve means rotatable by means of said gear teeth, the improvement comprising:

intermediate sleeve means comprised of a driven member and a driving member fixed to the outwardly extending gear teeth of the hub means, said intermediate sleeve means having outwardly extending gear teeth which mesh and coact with said inwardly extending gear teeth of said axial bore of said sleeve means, said intermediate sleeve means having a contoured shear connection of reduced cross-sectional area operably connecting and providing radial clearance between the surfaces of the driven and driving members of the intermediate sleeve means and said shear connection being substantially axially aligned with said gear teeth formed on said hub means and said sleeve means.

4,457,736

FLEXIBLE COUPLINGS

Howard S. Atkin, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Filed Jan. 21, 1982, Ser. No. 341,271

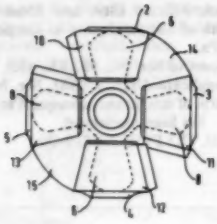
Claims priority, application United Kingdom, Jan. 31, 1981, 8103033

Int. Cl.³ F16D 3/00

U.S. Cl. 464—85 **14 Claims**

1. A flexible coupling for connecting two rotatable components comprising at least four substantially radially extending rigid inner members uniformly spaced relative to one another in a circumferential direction with respect to the axis of rotation of the coupling, a resilient bush mounted on each said rigid inner member, circumferentially alternate inner members being connected to one of said rotatable components, the other inner members being connected to the other rotatable component such that the same number of bushes is associated with each of the rotatable components, a rigid casing surrounding each bush and a web interconnecting adjacent pairs of said casings such that each one of said bushes on one rotatable component is

connected only to an adjacent one of said bushes on the other rotatable component and so that relative axial movement of the



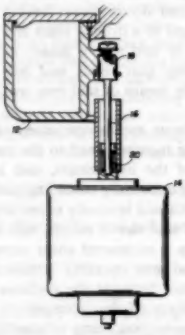
rotatable components is resisted resiliently by the torsional loading of the resilient bushes.

4,457,737

SMALL DIAMETER SHAFT CONNECTION

Thomas D. Sharples, Atherton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 8, 1981, Ser. No. 271,349
Int. Cl.³ F16C 3/00; F16D 3/76
U.S. Cl. 464—99 5 Claims



1. A torque-transmitting connector for coupling a small diameter spindle shaft to a larger member having a bore into which the shaft extends, said connector comprising:

a sleeve surrounding a portion of the shaft within the bore;

a first flange operatively associately with said sleeve at one end thereof;

said first flange initially having a shape substantially that of a concave frustocone coaxial with said sleeve;

a second flange operatively associated with said sleeve at an end opposite said one end;

said second flange initially having a shape substantially that of a convex frustocone with said sleeve;

each of said flanges initially having an inside aperture large enough to slide over said shaft and an outside diameter small enough to slide into said bore;

each of said flanges subsequently being reformed by pressure exerted thereon parallel to the axis of said sleeve to assume a shape substantially that of a disc perpendicular to the axis of said sleeve; and

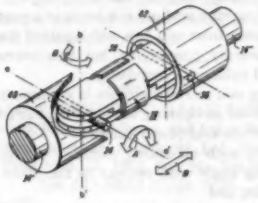
each of said flanges upon being reformed having an inside aperture small enough to tightly grip the exterior surface of said shaft and having an outside diameter large enough to tightly grip the interior surface of said bore.

4,457,738

ANTI-BACKLASH DOUBLE UNIVERSAL FLEXIBLE COUPLING

Thomas D. Gross, Los Altos, and Brian E. Jagger, Union City, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 19, 1982, Ser. No. 369,779
Int. Cl.³ F16D 3/20; B41J 1/30
U.S. Cl. 464—115 3 Claims



1. An anti-backlash double universal flexible coupling characterized by including

rotary driving means,

a driving pin secured to said driving means and supported at both its ends,

rotary driven means,

a driven pin secured to said driven means and supported at both its ends,

intermediate coupling means connected between said rotary driving and driven means, said coupling means comprising a pair of substantially identical coupling plates disposed parallel to one another and having at their ends, flat, facing bearing surfaces extending across the width dimension of said plates, said width dimension being substantially coextensive with the unsupported length of said pins, and between which said driving pin and said driven pin are captured for movement therealong, said pins being maintained coplanar and parallel to one another by said coupling means during movement to prevent skewing, and

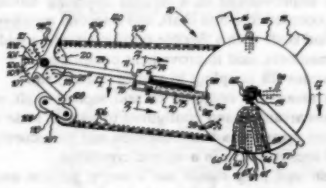
resilient means for urging said coupling plates together and into contact with said pins.

4,457,739

MULTI-RATIO DRIVE

Richard W. Iseman, Buffalo, N.Y., assignor to Iseman Enterprises, Inc., Buffalo, N.Y.

Filed Feb. 13, 1981, Ser. No. 234,371
Int. Cl.³ F16H 11/00
U.S. Cl. 474—49 24 Claims



1. A multi-ratio drive comprising first and second spaced sprockets, an endless flexibie member effectively engaging said first and second sprockets to transmit motion therebetween, a plurality of concentric rows of openings in said first sprocket, pins in said openings, first pin-actuating means for selectively extending pins from a retracted position in said concentric rows of openings, and second pin-actuating means for retracting said pins into said openings by magnetic action to thereby

vary the effective diameter of said first sprocket and thus vary the drive ratio between said first and second sprockets.

4,457,740

PIN FOR TENSION ROLLERS

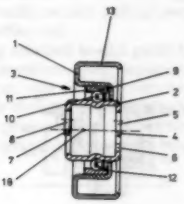
Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eussenheim, and Lothar Walter, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 27, 1981, Ser. No. 267,623

Claims priority, application Fed. Rep. of Germany, May 30, 1980, 8014496

Int. Cl.³ F16H *7/10*

U.S. Cl. 474—112 **9 Claims**



6. A central support pin for a tension roller where the tension roller includes a roller member rotatably supported on a rolling bearing mounted circumferentially about said pin, said pin formed as a hollow member comprising a continuous one piece sleeve having first and second ends and with a base at the first end and a guide element at the second end, the guide element extending transversely of said pin with an axis extending through said pin, and a bore eccentrically displaced from said axis, and means for eccentrically displacing said pin about said bore.

4,457,741

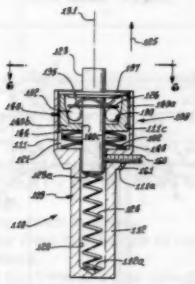
TENSIONER

Herbert W. Hoeptner, III, 273 Hermosa, San Luis Obispo, Calif. 93401

Continuation-in-part of Ser. No. 19,557, Mar. 12, 1979, Pat. No. 4,291,416. This application May 26, 1981, Ser. No. 266,705

Int. Cl.³ F16H *7/12*; B65H *59/10*; F16D *11/00*; F16B *2/00*

U.S. Cl. 474—138 **12 Claims**



1. A tensioning device for tensioning a flexible element, comprising

(a) body means having a bore therein,

(b) a plunger carried by the body means and movable axially relative thereto in the bore, and a first compression spring protectively confined by the body means in alignment with the plunger for urging the plunger axially in a first direction to exert biasing force operable to tension said element,

(c) the body means including an outer body defining a recess and an inner cup-shaped body movable axially within said recess, said bore intersecting said recess, the first compression spring located in said bore, the inner body having an interior ramp surface facing the plunger, said plunger extending in said recess and penetrating through the inner body, the ramp surface tapering inwardly in a second direction which extends generally opposite said first direction, and

(d) wedgable means located between the ramp surface and the plunger, and urging means urging the wedgable means into wedging engagement with the ramp surface and the plunger whereby the plunger may be displaced by the first spring in said first direction, but is blocked against displacement relative to the inner body in said second direction,

(e) and an additional spring in said recess urging said cup-shaped body in said first direction and to permit limited movement of said plunger in said second direction.

4,457,742

TORQUE TRANSMISSION BELT MEANS

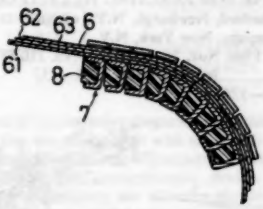
Yoshiyuki Hattori, Toyoake; Kazuma Matsui, Toyohashi, and Hiroji Kinbara, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 8, 1981, Ser. No. 261,937

Claims priority, application Japan, Jul. 3, 1980, 55-91444

Int. Cl.³ F16G *1/00*; F16C *1/22*

U.S. Cl. 474—201 **12 Claims**



1. A torque transmission belt means which is adapted to be extended along V-shaped grooves formed in a driving pulley and a driven pulley for transmitting the driving force of the driving pulley to the driven pulley, comprising:

a metallic ring which is adapted to be extended along the V-shaped grooves of said driving pulley and said driven pulley;

a series of blocks which are arranged along with said metallic ring so as to be shiftably engaged therewith;

said blocks being made of hard material having high strength, opposed side surfaces which are opposed to the walls of said V-shaped grooves of said pulleys so as to be contacted with said grooves, a back plate portion which transversely extends between said opposed side surfaces, a concave portion which is formed on one side of said back plate portion, surrounded by said side surfaces, and a ring supporting portion which is formed in the upper portion of said back plate portion and is provided with at least one groove for inserting said metallic ring therethrough; and

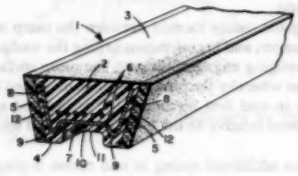
an elastic member made of elastic material which is accommodated within said concave portion and fixed to one surface of said back plate portion of said block so that the surface of said elastic member is contacted with the other surface of said back plate portion of an adjacent block.

4,457,743

POWER TRANSMISSION BELT

Edoardo Robecchi, Sesto S. Giovanni, and Renato Dell'Orto, Seregno, both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Feb. 23, 1982, Ser. No. 351,640
Claims priority, application Italy, Mar. 16, 1981, 20350 A/81
Int. Cl.³ F16G 1/00, 5/00, 1/26
U.S. Cl. 474—260 7 Claims



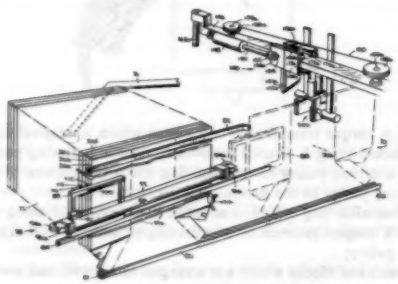
1. A V-belt comprising an elastomeric or plastomeric body having a major base, a minor base and two lateral convergent flanks, a traction-resistant insert member comprising a plurality of flexible and inextensible cords embedded into the body which are parallel and coplanar to each other, a series of longitudinally-spaced rigid members extending transversely across the belt body, characterized in that said belt comprises a continuous elastomeric or plastomeric layer covering each flank of the belt and having fibers dispersed substantially uniformly therein which are oriented perpendicularly to the surface of the lateral convergent flanks.

4,457,744

MACHINE FOR ERECTING HEXAGONAL DRUM

Robert J. Sanford, Newburgh, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Nov. 26, 1980, Ser. No. 210,851
Int. Cl.³ B31B 5/26, 1/52
U.S. Cl. 493—126 9 Claims



1. A machine for erecting a carton having oppositely disposed sides and a bottom from a blank by separating oppositely disposed sidewall-forming panels wherein the separation causes the bottom-forming panels of the blank to form the bottom of the carton, said machine comprising:

(a) a plurality of separating means, each movable in two directions that are perpendicular to one another;

(b) means for placing the separating means between the oppositely disposed sidewall-forming panels so that each separating means contacts the inside of one of the oppositely disposed sidewall-forming panels; and

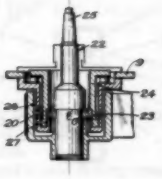
(c) means for moving the separating means apart linearly and towards the bottom-forming panels so that the separating means continue to contact the insides of their respective oppositely disposed sidewall-forming panels as the separating means are moved apart, thereby moving the oppositely disposed sidewall panels apart linearly to become oppositely disposed sidewall panels in the erected carton.

4,457,745

CENTRIFUGE WITH A BELT-DRIVEN SPINDLE

Klaus D. Broker; Paul Bruning, both of Oelde, and Eberhard Wenzel, Langenberg, all of Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Jun. 18, 1982, Ser. No. 389,639
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1981, 3125832
Int. Cl.³ B04B 15/00
U.S. Cl. 494—15 13 Claims



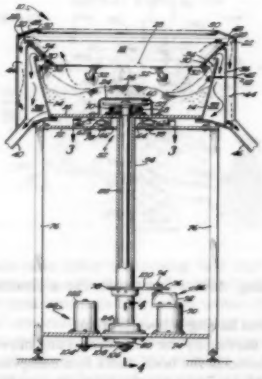
1. In a centrifuge having a frame, a drive-mechanism including a vertical spindle having a longitudinal axis, means including at least one bearing for rotatably mounting the spindle for self-alignment in space around a given point along the longitudinal axis of the spindle with respect to the frame of the centrifuge and a bearing housing supported on the frame and a belt for driving the spindle and having a midplane, the improvement wherein the mounting means includes means disposing the given point in the vicinity of the bearing, wherein the center of mass of the mounting means is situated in the vicinity of the given point and wherein the midplane of the drive belt extends in the vicinity of the given point.

4,457,746

APPARATUS FOR CENTRIFUGAL SEPARATION

Leon G. Feteri, Salem, S. Dak., assignor to Core Industries, Inc., Bloomfield Hills, Mich.

Filed Jan. 7, 1983, Ser. No. 456,513
Int. Cl.³ B04B 3/06
U.S. Cl. 494—47 12 Claims



1. Apparatus for centrifugal separation comprising:

a separator bowl for receiving particulate material to be separated into different weight components, said bowl having an outwardly inclined peripheral wall;

means for rotating said separator bowl at a predetermined speed;

vibrating means in cooperative association with said separator bowl operative to vibrate said bowl as it rotates, whereby material particles deposited in said bowl will be moved by centrifugal force and vibration generally outwardly towards the periphery thereof and thence upwardly along said inclined peripheral wall;

an outwardly inclined, annular guide baffle mounted at an elevated position above the bottom of said separator bowl and projecting above the top of said inclined peripheral wall, the top periphery of said guide baffle defining a first peripheral exit zone for relatively light weight particles flowing upwardly on said inclined peripheral wall and on said guide baffle; and

a separator ring attached to said guide baffle and extending outwardly therefrom, said separator ring terminating inwardly from said inclined peripheral wall in spaced apart relation thereto and defining therewith an annular opening comprising a second peripheral exit zone below said first peripheral exit zone for relatively heavy particles.

4,457,747

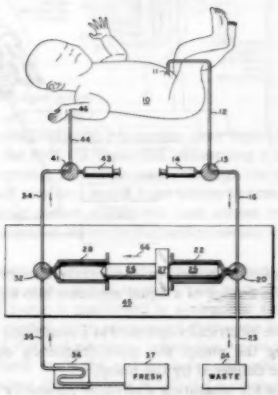
EXCHANGE TRANSFUSION MACHINE

Ho C. Tu, 241 NE. 199th La., North Miami Beach, Fla. 33179

Continuation-in-part of Ser. No. 145,316, May 30, 1980, abandoned. This application May 17, 1982, Ser. No. 379,064

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—4 **1 Claim**



1. A machine for withdrawing blood from a human and concurrently injecting into the human fresh blood from a source as replacement for the withdrawn blood, comprising:

(a) a first syringe,

(b) a first tubing system including:

(1) a first line from said human to said first syringe for carrying blood,

(2) a second line from said first syringe to a waste blood container for carrying blood, and

(3) a first stopcock having first and second positions:

(A) said first stopcock in said first position allows said first line to carry blood but prevents said second line from carrying blood, and

(B) said first stopcock in said second position prevents said first line from carrying blood but allows said second line to carry blood,

(c) a second syringe,

(d) a second tubing system, including:

(1) a third line from said second syringe to said human for carrying blood,

(2) a fourth line from said source to said second syringe, and

(3) a second stopcock having third and fourth positions:

(A) said second stopcock in said third position allows said third line to carry blood but prevents said fourth line from carrying blood, and

(B) said second stopcock in said fourth position prevents said third line from carrying blood but allows said fourth line to carry blood,

(e) a coupler coupling the piston of said first syringe with the piston of said second syringe and constraining the movements of said pistons in said syringes to be complementary and approximately volumetrically equal,

(f) means for withdrawing the piston in said first syringe, said withdrawing means characterized by a withdrawal rate which completely withdraws the piston in 15 to 45 minutes,

(g) means for depressing the piston in said first syringe, said depressing means characterized by a depression rate which completely depresses the piston in less than one minute.

4,457,748

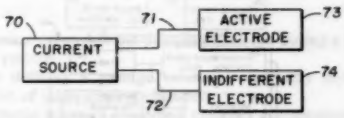
NON-INVASIVE DIAGNOSIS METHOD

Gary A. Lattin, Forest Lake, and Richard P. Spevak, Moundsview, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 11, 1982, Ser. No. 338,365

Int. Cl.³ A61N *1/30*

U.S. Cl. 604—20 **3 Claims**



1. A method of non-invasive diagnosis comprising the steps:

contacting the skin of a subject with an adhesive, iontophoretic, sweat-inducing drug-impregnated electrode carried by a self-contained iontophoretic device particularly adapted for ambulatory use whereby the device may be secured to the body of the subject;

activating the device while so secured to drive the drug from the electrode into the skin of the subject whereby sweat formation is induced on the skin;

removing the device from the body, and

collecting a predetermined volume of the sweat in situ with an absorbent test device constructed and arranged to provide a visual analytical quantitative indication of a predetermined component of the sweat in excess of a predetermined amount, the test device including an outer fluid-tight envelope with a transparent viewing portion and an inlet for the entrance of sweat thereto.

4,457,749

SHIELD FOR CONNECTORS

Marc Bellotti, Winnetka, and Robert Flagler, Libertyville, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

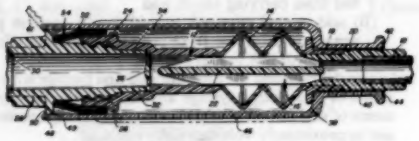
Filed Apr. 19, 1982, Ser. No. 369,709

Int. Cl.³ A61M *5/14*

U.S. Cl. 604—29 **14 Claims**

1. In a fluid flow set defining connector means on one end of a length of tubing for forming a sealed, essentially aseptic connection with a second connector, to permit fluid transfer through the joined connectors, the improvement comprising, in combination:

a tubular shield member disposed about said length of tubing in telescoping relation and movable along its length, one end of said shield member defining a first aperture through which the length of tubing extends, said first aperture being defined by a reduced diameter section and proportioned to define a first seal with the length of tubing, the other end of said tubular shield defining a second aperture



large enough to receive said connector means into the interior of the tubular shield member, said connector means being joined to a second connector, both connectors being positioned within the bore of said shield member, said second connector defining an annular flange that defines a sliding second seal with the bore of the shield member.

4,457,750

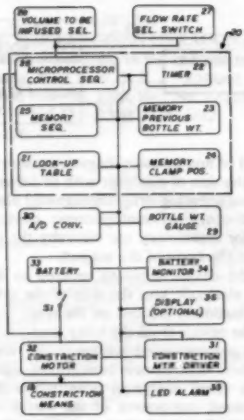
MICROPROCESSOR CONTROLLED INTRAVENOUS FEED SYSTEM

Charles C. Hill, Del Mar, Calif., assignor to Luther Medical Products, Inc., Costa Mesa, Calif.

Filed Nov. 2, 1981, Ser. No. 317,440

Int. Cl.³ A61M 5/16

U.S. Cl. 604—65 **20 Claims**



1. An intravenous feed system, comprising:

A. a free hanging container for intravenous fluid, including a gravity feed outlet to a flexible, intravenous tube, and constriction means for the said tube;

B. sensing means for detecting a weight change in the free hanging container to produce an analogue signal when intravenous fluid is fed therefrom;

C. means for converting the analogue signal into digital pulses;

D. clock means for determining Δt;

E. a plurality of microelectronic circuit registers to receive and output digital pulses, including:

i. an input register for receiving preset data for dw/dt flow rate and weight settings;

ii. accumulating registers to store updated container weight and constriction settings; and,

iii. output registers for outputting updated constriction settings, flow rate data, fluid weight data and alarm data;

F. a ROM, including:

i. a look-up table for determining updated constriction settings;

ii. a sequencing memory for converting input and instruction information into address words;

iii. a control sequence memory for generating program steps and jump pulses to control output operations; and,

G. an arithmetic unit for:

i. determining Δw, and dw/dt as measured;

ii. comparing the measured dw/dt with the preset dw/dt; and,

iii. determining the revised constriction settings based on the look-up table.

4,457,751

AUTOMATIC INFUSION PUMP

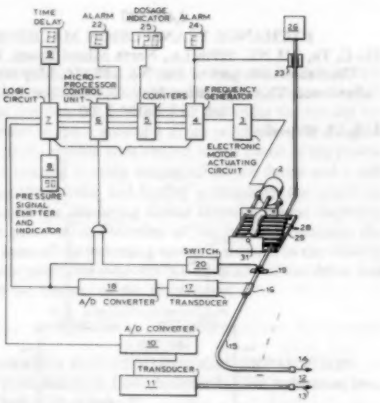
Hans Rodler, Pehamweg 3-5, Graz-Neuhart A-8053, Austria

Filed May 8, 1981, Ser. No. 261,550

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018641

Int. Cl.³ A61M 5/00

U.S. Cl. 604—66 **6 Claims**



1. An infusion pump for the intravenous or inter-arterial infusion of a dosage of a liquid medicine into a patient, which comprises

(a) a drive electrically operated at a controlled frequency for driving the pump, the drive frequency controlling the dosage delivered by the pump,

(b) means for measuring a physical parameter of the patient and for generating a digital signal corresponding to the measured physical parameter,

(c) means for generating a reference digital signal corresponding to an adjustable desired parameter,

(d) an electronic drive control comprised of a microprocessor, the control including

(1) a frequency generator having an output connected to the drive whereby the frequency of the drive and the corresponding dosage is controlled,

(2) digital-electronic means in the microprocessor and responsive to the digital signals,

(3) means for delivering a time delay signal to the digital-electronic means,

(4) the digital-electronic means in response to the signals maintaining the frequency unchanged as long as the difference between the digital signals is within the limits of a predetermined percentage range of deviation, increasing or decreasing the frequency by a set step after

a time delay responsive to the time delay signal when an upper limit of the range of deviation is exceeded or falls below a lower limit, and reducing the frequency to zero when the effect of the medicine changes the measured physical parameter of the patient beyond a predetermined limit of a percentage range within the time delay, and

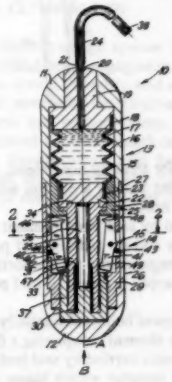
(e) digital indicator means connected to the microprocessor for generating an alarm signal when the limits are beyond a normal range.

4,457,752

SURGICALLY IMPLANTABLE PUMP

Csaba Vadasz, Richard-Wagner-Strasse 5, D-4930 Detmold, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 417,230
Int. Cl.³ A61M *5/00, 5/20*
U.S. Cl. 604—135 **10 Claims**



1. A surgically implantable pump to eject liquid into a subject in which the pump is implanted, comprising a case means to enclose the pump, an orifice means through the case means by which liquid may be ejected from within the case means, a flexible reservoir means within the case means to hold the liquid and to eject it through the orifice means upon being compressed;

a piston means to compress the reservoir means; and

magnetic responsive means to move said piston means only when the pump is positioned in a magnetic field, so that liquid is ejected upon positioning the pump in the magnetic field, the said magnetic responsive means including a spring which loads the piston means and which is compressed when the reservoir is full and a ratchet and pawl mechanism holding the spring against release, the pawl being magnetically responsive, wherein the pawl releases the ratchet step-by-step each time it is positioned within the magnetic field.

4,457,753

INTRAVENOUS METERING DEVICE

Giovanni Pastrone, Los Gatos, Calif., assignor to Oximetrix, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 278,954, Jun. 30, 1981, which is a continuation-in-part of Ser. No. 174,666, Aug. 1, 1980, Pat. No. 4,336,800. This application May 3, 1982, Ser. No. 374,489
Int. Cl.³ A61M *0/00*
U.S. Cl. 604—153 **7 Claims**

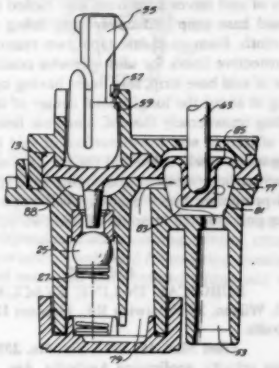
1. A device which precisely meters liquids for intravenous delivery from a liquid source to a patient, said device comprising:

a support structure including a device inlet for receiving liquid from the liquid source and a device outlet for removing liquid from said device;

a pumping chamber permitting liquid to be pumped from the liquid source to the patient, said pumping chamber having an inlet at the upper end of the chamber in communication with said device inlet and an outlet at the lower end of at least a portion of the chamber in communication with said device outlet;

an inlet valve at said pumping chamber inlet for blocking the flow of liquid out of said pumping chamber during pumping and for permitting the flow of liquid into said chamber between pumping periods;

an outlet valve at said pumping chamber outlet, said outlet valve being biased closed and being opened under the



pressure created in the pumping chamber during a pumping period;

means defining a passage extending upwardly from the outlet of said pumping chamber;

a discharge pressure measuring chamber communicating at its upper end with the upper end of said passage and communicating at its lower end with the device outlet;

a flexible diaphragm member forming a portion of the wall of the discharge pressure measuring chamber for measuring the discharge pressure of fluid pumped by said pumping means; and

a means for disabling said outlet valve to open the outlet of the pumping chamber whereby, by inverting the device, the device can be filled with liquid from the inlet to the outlet thereof without trapping air therein.

4,457,754

MULTI-PURPOSE SECUREMENT STRIP FOR USE ON THE BODY OF A PATIENT

Philip M. Buttaravoli, Potomac, Md., assignor to E-Med Corporation, Cincinnati, Ohio

Filed Jan. 29, 1982, Ser. No. 343,855
Int. Cl.³ A61M *25/02*
U.S. Cl. 604—180 **10 Claims**

1. An elongated multi-purpose securement strip for anchoring at least one medical device on a patient, said securement strip comprising an elongated, flat base strip having upper and

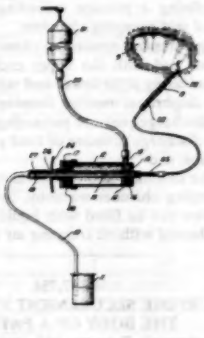
lower surfaces, an adhesive coating on said lower surface of said base strip to attach said base strip to said surface, an elongated flat cover strip having upper and lower surfaces and being of the same dimensions as and co-extensive with said base strip, a first portion of said cover strip including an end thereof being affixed to a corresponding portion of said upper surface of said base strip, a second portion of said cover strip being releasably and resealably affixable to said base strip upper surface by releasable and resealable adhesive and being shiftable between an open position and a closed position adhered to said upper surface of said base strip, a narrow liner element permanently affixed to said lower surface of said second portion of said cover strip and extending transversely at the free end thereof, converting said free end of said second portion of said cover strip to a pull tab for shifting said second portion of said cover strip from said closed to said open position, said base strip and cover strip being made of medical grade cloth, foam or plastic tape, two removable and disposable protective liners for said adhesive coating on said lower surface of said base strip, said liners having opposed end edges meeting at about the longitudinal center of said base strip and extending transversely thereof, a narrow liner element permanently affixed to said lower surface of said base strip and extending transversely thereof at the longitudinal center thereof, said narrow liner element underlying said opposed end edges of said protective liners enabling said opposed end edges to serve as pull tabs for removal of said two protective liners.

4,457,755

SURGICAL 'IN-LINE' EVACUATOR

John D. Wilson, 29 Woolwich Rd., Hunters Hill, N.S.W. 2110, Australia

Filed Mar. 18, 1982, Ser. No. 359,419
Claims priority, application Australia, Apr. 2, 1981, PE8270
Int. Cl.³ A61D *7/00*
U.S. Cl. 604—184 **5 Claims**



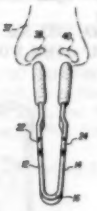
1. A surgical in-line evacuator comprising:
a cylindrical chamber having one end opened and its other end closed,
a catheter tube having one end connected to said open end of said cylinder chamber and its other end adapted for insertion into a body cavity to be drained,
an open-ended plunger tube longitudinally slidable through the closed end of said cylindrical chamber so that said plunger tube has an inner end open to the inside of said cylindrical chamber and an outer end disposed outside that cylindrical chamber,
means for closing said outer end of said plunger tube,
a piston plunger axially slidable within said cylindrical chamber and mounted on said inner end,
an irrigation liquid inlet which opens to said cylindrical chamber adjacent said open end of said cylindrical chamber,
an irrigation liquid supply source tube-connected to said inlet; and
means for closing said inlet, said means for closing comprises said piston plunger closing said inlet when the plunger is at the end of its stroke adjacent said open end.

4,457,756

NOSE BLEED CLIP

Eugene B. Kern, 1708 Viola Rd., NE., and William B. Westwood, 211 SW. 23 Ave., both of Rochester, Minn. 55901

Filed Apr. 14, 1982, Ser. No. 368,317
Int. Cl.³ A61B *17/24*; A61M *31/00*
U.S. Cl. 604—286 **10 Claims**



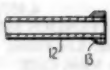
1. A device for treating nose bleed, comprising:
a body element having a portion adapted to be received in one of the nostrils;
means carried by said body element for engaging a portion of the nose and for biasing said portion of the body element into engagement with a portion of the nasal mucosa to at least apply pressure to said portion of the nasal mucosa;
said body element being substantially U-shaped; said portion of the body element comprising a first elongated leg member; said means carried by said body element comprising a second leg member which biases against said portion of the nose to urge a portion of the first leg member into engagement with said portion of the nasal mucosa;
absorbent means disposed over the portion of the first leg member which engages said portion of the nasal mucosa;
said absorbent means being wetted with a vasoconstrictive agent;
wherein the vasoconstrictive agent comprises phenylephrine.

4,457,757

DEVICE FOR DRAINING AQUEOUS HUMOUR

Anthony C. B. Molteno, 9 Fairfax St., Dunedin, New Zealand

Filed Jul. 20, 1981, Ser. No. 284,746
Int. Cl.³ A61M *27/00*
U.S. Cl. 604—294 **6 Claims**



1. A device for draining aqueous humour from an eye comprising first and second ridged bodies which are adapted for side by side attachment to the sclera of one eye, each ridged body having disposed thereon, on the surface thereof opposite that deposited on the sclera, a ridge so as to extend outwardly

of the eyeball when said attachment is made, and encompassing a space, a first tube extending between the ridged bodies and communicating with said spaces encompassed by the ridges, and a second tube communicating with said space encompassed by the ridge of the first ridged body and being sufficiently long to communicate through the sclera with the anterior chamber of the eye to which the ridged bodies are attached, said ridged bodies comprising plates each having on one side, said ridge, said plates being imperforate internally of said ridge, said plates on their other sides being concavely curved so as to closely match the sclera of an eyeball and said device being sized to fit on said sclera of said single eye.

4,457,758

VENTING ASSEMBLY FOR A SEALED BODY FLUID DRAINAGE DEVICE

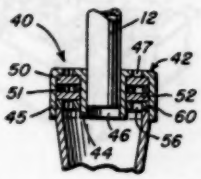
William J. Norton, Berkeley Heights, N.J., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Oct. 6, 1981, Ser. No. 309,130

Int. Cl.³ A61M 1/00

U.S. Cl. 604—324 **3 Claims**

1. In a closed body fluid drainage system having a fluid retaining drainage bag with a body engageable fluid drainage tube extending therefrom, a vent assembly, said assembly forming a gas path from the system to the exterior thereof, said assembly comprising first and second filters, spacer means retaining said filters in spaced relation to each other along said path to define a space therebetween, said first filter being positioned inward of said second filter and formed of a gas permeable liquid-repellent material capable of precluding outward movement of liquid therethrough from the drainage system, said second filter being formed of a gas permeable bacteria barrier material, said first filter shielding said second filter from wetting through outward movement of liquid through said passage and thereby preserving the effectiveness of the bacteria filter barrier, a filter mounting housing receiving said filters, said housing having a fluid flow passage defined



therethrough, said filters being received within said passage in stacked spaced relation to each other, said mounting housing including a filter supporting inner shoulder within said passage, and a filter retaining outer cap, said filter retaining outer cap including a depending tube-receiving tubular extension and a depending peripheral wall, said filters being annular and received about said extension and confined within said wall.

4,457,759

ENVIRONMENT-PROTECTING METHOD FOR THE LIMING OF RAW HIDES

Kálmán Fekete; Tamás Karnischer; István Malovecz; István Tuba; Béla Lukasics; Mágdolna Makk née Petrányi; Zoltán Princz, and Antal Szabó, all of Budapest, Hungary, assignors to Bor- Mubor- es Cipoipari Kutato Intezet, Budapest, Hungary

PCT No. PCT/HU82/00009, § 371 Date Oct. 29, 1982, § 102(e) Date Oct. 29, 1982, PCT Pub. No. WO82/03228, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 10, 1982, Ser. No. 440,222

Claims priority, application Hungary, Mar. 12, 1981, 616/81

Int. Cl.³ C14C *1/06, 1/04*

U.S. Cl. 8—94.16 **12 Claims**

1. An improved hide unhairing and liming method resulting in an exhaust sewage of reduced hair decomposition products and sulfide ion pollution, said process comprising:

treating hides with a proteolytic enzyme solution to loosen most of the hair present on the hides;

removing the loosened hair from the hides without destroying the hair;

rinsing the hides of enzyme solution;

liming the hides in a sulfide liquor of relatively low strength containing not more than 2.0 percent by weight of the hides of sodium sulfide or sodium hydrogen sulfide, and mixtures thereof; and thereafter adding hydrogen peroxide to the liquor in an amount of 0.25 to 1.0 percent by weight of the hides sufficient to oxidize the sulfide ions present in the liquor.

4,457,760

PROCESS FOR DESIZING AND BLEACHING CLOTH WITH A HYDROGEN PEROXIDE-BASED BATH IN A SINGLE OPERATION

Jean-Marie Cholley, Paris, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Dec. 28, 1981, Ser. No. 335,100

Claims priority, application France, Dec. 31, 1980, 80 27866

Int. Cl.³ D06L *3/02, 1/06, 1/14, 3/00*

U.S. Cl. 8—111 **9 Claims**

1. A process for desizing and bleaching cellulosic fabrics in a single operation, which process comprises impregnating cellulosic cloth wih a basic desizing-bleaching composition containing hydrogen peroxide, a starch-degrading enzyme, and an alkali metal hydroxide.

4,457,761

METHOD AND APPARATUS FOR MARKING CONTACT LENSES

Richard Sliger, Tuscon, Ariz., assignor to Precision Cosmet Co., Inc., Minnetonka, Minn.

Filed Feb. 16, 1983, Ser. No. 466,786

Int. Cl.³ B29D *11/00;* **D06P** *3/00;* **G02C** *7/04*

U.S. Cl. 8—507 **13 Claims**

13. A method of marking contact lenses comprising the steps of:

(a) providing a marking indicia dye disposed on a non-gel film;

(b) supporting said film in a film cartridge and providing force dispersion means behind said film;

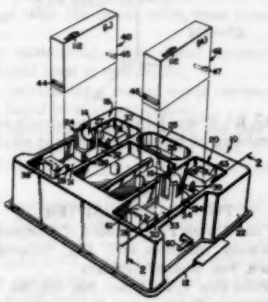
(c) providing a lens supporting pedestal and positioning a lens to be marked on said pedestal;

(d) guiding said cartridge over said pedestal;

(e) engaging said cartridge and said pedestal into a lens marking position to assure proper alignment and to assure proper marking force is supplied between said lens to be marked and said film;

(f) releasing and removing said cartridge from engagement with said pedestal after a predetermined time of engagement;

(g) developing the image transferred to said lens from said indicia dye on said film; and



(h) removing said lens from said pedestal and rinsing said lens in an appropriate saline solution.

4,457,762

STABILIZED WATER SLURRIES OF CARBONACEOUS MATERIALS

John G. Papalos, Ledgewood; Josè L. Villa, Bridgewater, both of N.J.; Kathy A. Knitter, Newark, Calif., and Arpad Savoly, Martinsville, N.J., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Jan. 7, 1983, Ser. No. 456,394

Int. Cl.³ C10L *1/32*

U.S. Cl. 44—51 **16 Claims**

1. A water slurry of solid particulate carbonaceous materials having present a condensation product and salts thereof of a condensate of a substituted phenol sulfonic acid selected from the group consisting of

(a) an arylphenol sulfonic acid,

(b) an aralkylphenol sulfonic acid,

(c) an arylphenol sulfonic acid and arylsulfonic acid mixture, and

(d) an aralkylphenol sulfonic acid and arylsulfonic acid mixture,

condensed with from about 0.5 to about 4.0 moles of formaldehyde per mole of sulfonic acid with the proviso that the weight ratio of substituted phenol sulfonic acid to arylsulfonic acid is from about 0.95:0.05 to about 0.05:0.95 in the mixtures, the condensation product being present in an amount sufficient to reduce viscosity of the water slurry to stabilize carbonaceous materials in water network and to improve pumpability of the water slurry.

4,457,763

DIESEL FUEL CETANE IMPROVER

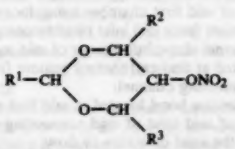
Paul D. Seemuth, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 7, 1983, Ser. No. 548,928

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—57 **5 Claims**

1. Diesel fuel containing a cetane increasing amount of a dioxane nitrate having the structure



or

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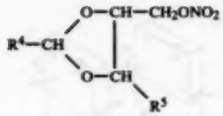


wherein R^1, R^2, R^3, R^4 and R^5 are independently selected from the group consisting of hydrogen and C_{1-12} alkyls, and mixtures thereof.

4,457,764

TWO-STAGE GASIFIER

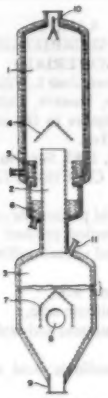
Rolf Dörling, and Ulrich Premel, both of Gummersbach, Fed. Rep. of Germany, assignors to L & C Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Feb. 9, 1983, Ser. No. 469,789

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1982, 3205346

Int. Cl.³ B01J *3/00*; C10J *3/20, 3/76*

U.S. Cl. 48—62 R **1 Claim**



1. A flue-stream reactor for gasifying fossil fuels which contain ballast, said reactor comprising:

a first cylindrical, cooled, and insulated reaction chamber, which includes an axial inlet for accommodating a gasification burner;

a second cylindrical, cooled, and insulated reaction chamber, which includes an inlet for the addition of gasification material; said second reaction chamber further including a radial outlet disposed transverse to the axial direction of said second chamber, and a funnel-shaped discharge for solid ash and slag; said first and second reaction chambers being disposed one after the other in the axial direction thereof;

a cooled channel which is coaxial with, interconnects, and provides communication between said first and second reaction chambers; as viewed in the axial direction of flow, said connecting channel has an inlet which communicates with said first chamber, and an outlet which communicates with said second chamber; said burner in said axial inlet of said first chamber being located at that end thereof remote from said inlet of said connecting channel, and said funnel-shaped discharge of said second chamber being located at that end thereof remote from said outlet of said connecting channel;

a cooled deflection hood located in said first reaction chamber ahead of said inlet of said connecting channel when viewed in the axial direction of flow;

a cooled, annular, trough-like device for collecting liquid ash and slag, said trough-like device being provided with a discharge opening, and being disposed on the inner wall of said first reaction chamber after said inlet of said connecting channel when viewed in the axial direction of flow;

a water bath disposed between said connecting channel and the inner wall of said first reaction chamber after said trough-like device when viewed in the axial direction of flow; and

a cooled second deflection hood located in said second reaction chamber ahead of said radial outlet and said funnel-shaped discharge when viewed in the axial direction of flow.

4,457,765

ABRASIVE BODIES

William I. Wilson, 18 East St., East Town Johannesburg, Transvaal, South Africa

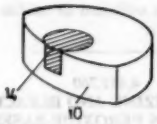
Continuation of Ser. No. 240,890, Mar. 5, 1981, abandoned, which is a continuation of Ser. No. 14,549, Feb. 23, 1979, abandoned. This application Jan. 19, 1983, Ser. No. 459,130

Claims priority, application South Africa, Feb. 28, 1978, 78/1154

The portion of the term of this patent subsequent to Aug. 26, 1997, has been disclaimed.

Int. Cl.³ B24D *11/00*

U.S. Cl. 51—293 **15 Claims**



1. A drill crown including a rotatable circular end having mounted therein a plurality of abrasive bodies, each abrasive body including an abrasive compact comprising a mass of diamond or cubic boron nitride particles, present in an amount of at least 70 percent by volume of the compact, bonded into a hard conglomerate and support means covering a part of the surface of the compact and bonded to the compact, wherein the support means covers more than 50 percent of the surface of the compact and wherein the compact is in the form of a circular disc embedded in the support means so as to provide an exposed arcuate surface or edge which extends over less than 50 percent of the circumference of the disc and which provides an abrading formation,

the support means of each abrasive body being embedded in the circular end of the crown and secured thereto by brazing and the exposed arcuate surface or edge of each body presenting an exposed abrading formation for the crown.

4,457,766

RESIN SYSTEMS FOR HIGH ENERGY ELECTRON CURABLE RESIN COATED WEBS

Lawrence D. Caul, Buffalo, N.Y., assignor to Kennecott Corporation, Cleveland, Ohio

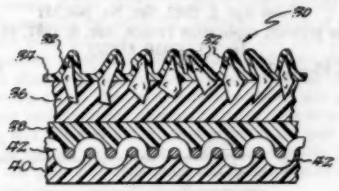
Filed Oct. 8, 1980, Ser. No. 195,030

Int. Cl.³ B05D *3/06*

U.S. Cl. 51—298 **9 Claims**

1. A method of forming a coated abrasive comprising providing a fibrous backing material, coating the backing material on one side with a resin system comprising an epoxy acrylate, a pyrrolidone derivative and an inorganic filler, to form a face fill coat, curing said face fill coat by exposure to electron radiation, applying a back fill coat to the opposite side of said fibrous material, wherein said back fill composition comprises an epoxy acrylate resin, a pyrrolidone derivative and an inorganic filler, curing said back fill by exposure to an electron radiation source, applying a make coat over the face coat

wherein said make coat comprises an epoxy acrylate resin, a pyrrolidone derivative and an inorganic filler, applying abrasive grain material to said make coat, exposing said make coat having embedded therein the abrasive grain material to a curing amount of electron radiation, applying a size coat over the



abrasive grain and make coat wherein said size coat comprises an epoxy acrylate resin, a pyrrolidone derivative, an acrylic acid derivative and inorganic filler and curing said wet size coat by exposure to a source of electron radiation to cure said size coat.

4,457,767

ALUMINA-ZIRCONIA ABRASIVE

Simon Poon, and Ronald W. Trischuk, both of Niagara Falls, Canada, assignors to Norton Company, Worcester, Mass.

Filed Sep. 29, 1983, Ser. No. 537,214
Int. Cl.³ C09K 3/14
U.S. Cl. 51—298 **4 Claims**

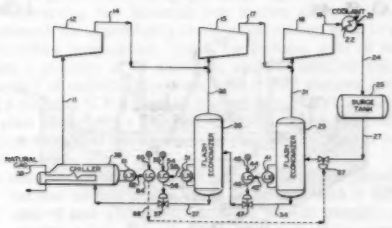
1. Fused alumina/zirconia near eutectic abrasive grits with 0.1 to 2.0% by weight of yttrium oxide calculated at Y_2O_3, and having a maximum spacing of zirconia rods of 4,000 Angstroms, as measured at the eutectic cell centers.

4,457,768

CONTROL OF A REFRIGERATION PROCESS

Robert M. Bellinger, Maracaibo, Venezuela, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 13, 1982, Ser. No. 449,281
Int. Cl.³ F25B 1/00
U.S. Cl. 62—21 **20 Claims**



1. Apparatus comprising:
a compression system;
means for providing a refrigerant gas to the suction inlet of said compression system;
cooling means;
a surge tank;
means for passing compressed refrigerant from the discharge outlet of said compression system through said cooling means to said surge tank, wherein said compressed refrigerant is at least partially condensed in said cooling means;
a first flash economizer;
means for providing liquid refrigerant from said surge tank to said first flash economizer;
a chiller;
means for providing liquid refrigerant from said first flash economizer to said chiller;
means for passing a process stream to be cooled in heat exchange with the liquid refrigerant contained in said chiller;
means for establishing a first signal representative of the actual liquid level in said chiller;
means for establishing a second signal representative of the desired liquid level in said chiller;
means for comparing said first signal and said second signal and for establishing a third signal which is responsive to the difference between said first signal and said second signal;
means for manipulating the flow rate of liquid refrigerant to said first flash economizer in response to said third signal;
means for establishing a fourth signal representative of the actual liquid level in said first flash economizer;
means for establishing a fifth signal representative of the desired liquid level in said first flash economizer;
means for comparing said fourth signal and said fifth signal and for establishing a sixth signal which is responsive to the difference between said fourth signal and said fifth signal; and
means for manipulating the flow rate of liquid refrigerant from said first flash economizer to said chiller in response to said sixth signal.

11. A method for manipulating liquid levels in a first flash economizer and a chiller associated with a refrigeration system, wherein a refrigerant gas is compressed and at least partially condensed with the compressed, at least partially condensed refrigerant being provided to a surge tank, wherein liquid refrigerant in said surge tank is provided to said first flash economizer, wherein liquid refrigerant in said first flash economizer is provided to said chiller and wherein a process stream to be cooled is passed in heat exchange with the liquid refrigerant contained in said chiller, said method comprising the steps of:
establishing a first signal representative of the actual liquid level in said chiller;
establishing a second signal representative of the desired liquid level in said chiller;
using computing means to compare said first signal and said second signal and to establish a third signal which is responsive to the difference between said first signal and said second signal;
manipulating the flow rate of liquid refrigerant to said first flash economizer in response to said third signal;
establishing a fourth signal representative of the actual liquid level in said first flash economizer;
establishing a fifth signal representative of the desired liquid level in said first flash economizer;
using computing means to compare said fourth signal and said fifth signal and to establish a sixth signal which is responsive to the difference between said fourth signal and said fifth signal; and
manipulating the flow rate of liquid refrigerant from said first flash economizer to said chiller in response to said sixth signal.

4,457,769

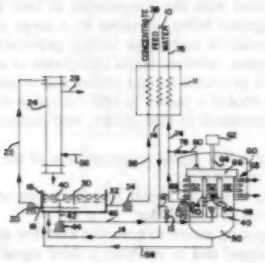
FREEZE CONCENTRATION APPARATUS AND PROCESS

Gerald E. Engdahl, Wheaton, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Division of Ser. No. 160,002, Jun. 16, 1980, Pat. No. 4,318,068. This application Oct. 22, 1981, Ser. No. 313,690
Int. Cl.³ B01D 9/04
U.S. Cl. 62—532 **14 Claims**

1. A freeze concentration apparatus means designed, sized and arranged for providing an aqueous ice slurry of reduced viscosity containing ice crystals of increased size to facilitate subsequent washing of the ice crystals, including:
a warm concentrator tank;

a conduit means to deliver an aqueous liquid mixture feed stream to the warm concentrator tank;
a cold concentrator tank;
a conduit means to deliver aqueous liquid mixture from the warm concentrator tank to the cold concentrator tank;
conduit means to feed the liquid mixture from the cold concentrator tank to a primary freeze exchanger for indirect cooling by heat exchange to a cold fluid to form ice crystals in the liquid mixture;
means to feed the liquid mixture containing ice crystals from the primary freeze exchanger to the cold concentrator tank;
conduit means to withdraw liquid mixture from the cold concentrator tank concentrated by the freezing of water therefrom;
means to withdraw an ice slurry from the cold concentrator tank and deliver it to the warm concentrator tank;
means to withdraw an ice slurry from the warm concentrator tank, which is designed, sized and arranged to reduce the viscosity of the slurry and to promote growth of the ice crystals, and deliver it to an ice slurry washer;
means to wash the ice slurry in the washer with water and to collect washed ice and an aqueous mixture;
conduit means to remove the aqueous mixture from the washer; and
means to remove the washed ice from the washer.



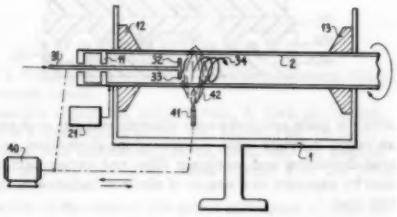
8. A method for providing an aqueous ice slurry of reduced viscosity containing ice crystals of increased size to facilitate subsequent washing of the ice crystals, including:
delivering an aqueous liquid mixture feed stream to a warm concentrator tank;
delivering an aqueous liquid mixture feed stream from the warm concentrator tank to a cold concentrator tank;
feeding the liquid mixture from the warm concentrator tank to a primary freeze exchanger for indirect cooling by heat exchange to a cold fluid to form ice crystals in the liquid mixture;
feeding the liquid mixture containing ice crystals from the primary freeze exchanger to the cold concentrator tank;
withdrawing liquid mixture from the cold concentrator tank concentrated by the freezing of water therefrom;
withdrawing an aqueous ice slurry from the cold concentrator tank and delivering it to the warm concentrator tank, which is designed, sized and arranged to reduce the viscosity of the slurry and to promote growth of the ice crystals;
withdrawing an aqueous ice slurry containing ice crystals of increased size from the warm concentrator tank and delivering it to an aqueous ice slurry washer;
washing the aqueous ice slurry in the washer with water and collecting washed ice and an aqueous mixture;
removing the aqueous mixture from the washer; and
removing the washed ice from the washer.

4,457,770

METHOD AND APPARATUS FOR THE PRODUCTION OF OPTICAL FIBERS WITH LATERAL GASEOUS INJECTION

Michel Faure; Yves Lumineau, and André Jouanin, all of Conflans-Ste-Honorine, France, assignors to Lignes Telegraphiques & Telephoniques, Honorine, France

Filed Apr. 1, 1982, Ser. No. 364,251
Claims priority, application France, Apr. 8, 1981, 81 07038
Int. Cl.³ C03B *37/025*
U.S. Cl. 65—3.12 **9 Claims**



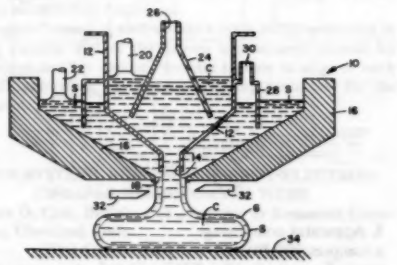
1. A method for the production of optical fiber preforms comprising, rotating a tube, heating a cross-section of said tube, supplying glass-forming gaseous compounds, which can decompose under the effect of said heating, whereby at least part of the products obtained are deposited on the inner walls of the tube, said supplying comprising directing said gaseous compounds toward said tube at an angle $>0°$ and $\leqq 90°$ with respect to an axis radial to the tube axis in a vortex whirling path along the inner wall of said tube into said heated cross-section.

4,457,771

FORMING LAMINATED ARTICLES FROM A COMPOSITE ENCAPSULATED CHARGE OF MOLTEN GLASS

Raymond R. Ambrogi, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 259,493, May 1, 1981, abandoned. This application Jan. 27, 1983, Ser. No. 461,613
Int. Cl.³ C03B *17/00, 7/00*
U.S. Cl. 65—66 **2 Claims**



1. A method of forming a laminated article from a discrete composite charge of molten glass which method (1) comprises initially delivering a charge of molten skin glass downwardly through means defining a first stationary orifice from a supply of said skin glass, (2) delivering a charge of molten core glass centrally of said skin glass downwardly though means defining a separate fixed orifice positioned coaxially with and above said first stationary orifice, said molten core glass being delivered from a supply of said core glass which is separated from said supply of skin glass, (3) surrounding the core glass with

the skin glass while simultaneously delivering both glasses from said first stationary orifice, (4) pneumatically controlling the delivery of said skin glass downwardly through said first stationary orifice by regulating the amount and direction of pressure forces applied to the supply of said skin glass, (5) pneumatically controlling the delivery of said core glass downwardly through said orifices by varying upward and downward pressure forces exerted in said separate supply of core glass, (6) severing the delivered combined charge of skin and core glass from said supply of skin glass and core glass and simultaneously completely surrounding said core glass with said skin glass to form a discrete composite charge of molten glass having a core glass encapsulated within a skin glass, (7) delivering said composite charge of molten glass to a molding surface, and (8) exerting a positive force on said discrete charge of molten glass to form a laminated article having a core of one glass which is completely surrounded by a skin of a second glass.

4,457,772

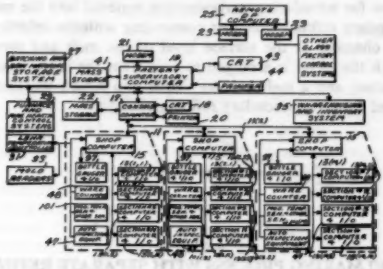
MANAGEMENT CONTROL SYSTEM FOR FORMING GLASSWARE

James D. Haynes; Jerome A. Kwiatkowski, and Glenn H. Mapes, all of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 281,466, Jul. 8, 1981, abandoned. This application Feb. 22, 1983, Ser. No. 468,457

Int. Cl.³ C03B *9/40*

U.S. Cl. 65—160 **9 Claims**



1. In a glassware forming system having at least one furnace for converting raw materials into molten glass, at least one forehearth for controllably cooling said molten glass to a predetermined temperature, means for forming gobs of molten glass, a plurality of IS machines, each IS machine having a plurality of individual sections, each of said sections performing a plurality of functions to convert said gobs of molten glass to glass containers, a lehr and means for conveying said containers from said IS machines to said lehr, a control system comprising:

a plurality of section control means, each of said plurality of section control means being associated with a different one of said plurality of sections of said plurality of IS machines for controlling the operation of its respective section in said glassware forming system, said section control means controlling both the timing and phase relationship between each of the sections of each of said plurality of machines;

a plurality of machine control means, each of said plurality of machine control means being associated with a different one of said plurality of IS machines and being in communication with each of the section control means of its respective machine for controlling each of the section control means of its respective IS machine, each of said plurality of said machine control means including means for varying the timing and the phase relationship of each of the sections of its respective IS machine and including means for controlling the speed of its respective machine;

a console computer in communication with each of said plurality of machine control means and monitoring said plurality of machine control means for controlling the job scheduling for each of said plurality of machines, said console computer receiving job status reports from each of said plurality of machine control means; and

a factory supervisory computer in communication with said console computer to manage information on raw material inventory, glassware inventory, the status of jobs being run in each stop, factory maintenance, and job scheduling data, and to determine and provide to the console computer instructions to load said machine control means in response to operator instructions or to predicted job termination data, and to provide information for the control of raw materials inventory, furnace operation and glassware inventory warehousing.

8. A method for forming glassware containers from raw materials in a glassware container forming system comprising:

storing information relating to the proportion of raw materials to be used in each of a plurality of jobs;

selecting one of said plurality of jobs;

generating commands to a mixing means to cause said mixing means to mix said raw materials in the proportion required for said selected job;

controllably conveying said mixed raw materials to a furnace to be converted into molten glass;

converting said molten glass into glassware containers; and

determining the quanity of glass being converted into glassware containers, wherein said step of controllably conveying said mixed raw materials to a furnace comprises the step of conveying an amount of mixed raw materials to said furnace corresponding to said quantity of glass being converted into glassware containers.

4,457,773

MAGNESIUM PHOSPHATE FLUID FERTILIZER

George S. Sley, Fort Pierce, Fla., assignor to Charles W. Heizer, Arnold, Md.

Continuation-in-part of Ser. No. 363,549, Mar. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 229,082, Jan. 28, 1981, abandoned. This application Jun. 21, 1983, Ser. No. 506,378

Int. Cl.³ C05B *9/00, 11/00*

U.S. Cl. 71—33 **16 Claims**

1. A method of preparing a high magnesium content liquid fertilizer comprising:

(a) agitating about 300 parts by weight of a 29% to 85.7% phosphoric acid solution;

(b) mixing about 100 parts by weight of magnesium hydroxide and about 100 parts by weight of water in a plurality of steps with said phosphoric acid solution;

(c) adding about 5 parts by weight of a dispersing agent to said mixture of (a) and (b);

(d) adding about 5 parts by weight of an emulsifying agent to said mixture of (a), (b) and (c); and

(e) adding sufficient water to bring the total water addition to about 125 parts by weight; whereby storage stable magnesium phosphate fluid fertilizer is produced.

4,457,774

SELECTIVELY HERBICIDAL 4-AMINO-6-TERT.-BUTYL-3-ETHYLTHIO-1,2,4-TRIAZIN-5(4H)-ONE

Ludwig Eue, Leverkusen; Robert Schmidt, Berg.-Gladbach, and Karlfried Dickoré, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 18, 1981, Ser. No. 303,658

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1980, 3041587

Int. Cl.³ A01N *43/64*

U.S. Cl. 71—93 1 Claim

1. A process for selectively killing monocotyledon and dicotyledon weeds in the cultivation of cereal and leguminous crops comprising applying to the crops or to a habitat thereof a selectively weed-herbicidally effective amount of (i) 4-amino-6-tert.-butyl-3-ethylthio-1,2,4-triazin-5 (4H)one.

4,457,775

SALT-COATED MAGNESIUM GRANULES

Michael H. Legge, Tooele; John F. Clarkson, Salt Lake City, both of Utah, and William D. Bachman, Middletown, N.J., assignors to AMAX Inc., Greenwich, Conn.

Filed May 19, 1983, Ser. No. 496,350

Int. Cl.³ C22C *1/04*

U.S. Cl. 75—0.5 B 15 Claims

1. In a process for dispersing magnesium in a molten salt bath containing said magnesium, said salt bath comprising a composition of NaCl-KCl-$CaCl_2$ maintained at a temperature above the melting point of said magnesiu-m, the improvement which comprises

maintaining in said salt bath an amount of MgO at least sufficient to form a substantially stable dispersion of magnesium beads following high energy stirring,

and solidifying said bath mixture to form a friable mass having substantially spheroidal granules of magnesium of average size ranging from about 10 to 100 mesh (U.S. Standard) dispersed therethrough capable of being separated from said friable mass by comminution.

4,457,776

PROCESS FOR THE REMOVAL OF ARSENIC COMPOUNDS FROM TUNGSTEN OR MOLYBDENUM CONCENTRATES

Jan P. Van't Sant, Westervoort, and Arjen Nieuwhof, Arnhem, both of Netherlands, assignors to Shell Internationale Research Maatschappij B.V., Netherlands

Division of Ser. No. 341,417, Jan. 21, 1982, Pat. No. 4,420,331. This application Aug. 2, 1983, Ser. No. 519,626

Claims priority, application Netherlands, Feb. 12, 1981, 8100668

Int. Cl.³ C22B *1/11, 1/12;* C01G *39/00, 41/00*

U.S. Cl. 75—6 4 Claims

1. A process for removing loellingite and arsenopyrite and other impurities from an ore comprising iron tungstate which comprises subjecting the ore in a finely ground state to flotation in order to selectively remove a part of the loellingite, arsenopyrite and other impurities, yielding a product stream basically comprising partially purified iron tungstate, subjecting the iron tungstate product stream to leaching with a strong acid to lower the content of iron compounds in this product stream, subjecting the leached product stream to magnetic separation yielding an iron tungstate concentrate having a reduced iron content and a solution of an iron salt, subjecting the iron tungstate concentrate to extraction with an aqueous solution of a ferric compound at a pH below 2.5 and a temperature of at least 60° C. and recovering a purified iron tungstate comprising less than 2000 ppm of arsenic.

4,457,777

STEELMAKING

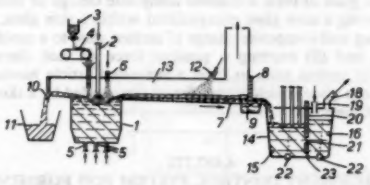
Ian K. MacGregor; Robert Scholey, both of London, and Gene D. Spenceley, Stokesley, all of England, assignors to British Steel Corporation, England

Filed Sep. 1, 1982, Ser. No. 413,872

Claims priority, application United Kingdom, Sep. 7, 1981, 8127021

Int. Cl.³ C21C *7/00*

U.S. Cl. 75—51 31 Claims



1. Apparatus for steelmaking comprising an initial reaction chamber for containing a steel melt arranged to receive source material in the form of scrap, pre-reduced iron or combinations of scrap and pre-reduced iron, an overhead lance for the introduction of an oxidising gas to the initial reaction chamber, means for introducing, below the level of the surface of the melt in the reaction chamber, a melt stirring fluid medium, means for introducing carbonaceous material into the melt; a secondary refining chamber connecting with the initial reaction chamber at the surface level of the melt and through which the metal is arranged to pass from the initial reaction chamber; and a melt holding vessel into which the metal is passed from the secondary refining chamber.

4,457,778

STEELMAKING PROCESS WITH SEPARATE REFINING STEPS

Hiroyuki Nakashima, Kisarazu; Morihiro Sumida, and Hiroki Goto, both of Kimitsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 362,839, Mar. 29, 1982, Pat. No. 4,411,696, which is a division of Ser. No. 243,451, Mar. 13, 1981, Pat. No. 4,388,112. This application Jun. 14, 1983, Ser. No. 504,285

Claims priority, application Japan, Mar. 21, 1980, 55-34693; Jan. 23, 1981, 56-8855

Int. Cl.³ C21C *7/00*

U.S. Cl. 75—51 1 Claim

1. A method for desiliconizing, dephosphorizing and decarburizing molten pig iron, which comprises subjecting molten pig iron from a blast furnace to the following separate and sequential steps:

(a) desiliconizing molten pig iron to an Si content of 0.20% or less;

(b) dephosphorizing said desiliconized molten pig iron to a P content of 0.040% or less in a vessel while forming a dephosphorization slag and a body of dephosphorized molten pig iron;

(c) withdrawing said dephosphorized molten pig iron from said vessel, whereby dephosphorization slag remains in said vessel; and

(d) adding new molten pig iron from a blast furnace to said vessel containing said dephosphorization slag, said molten pig iron containing an oxidizer for desiliconization prior to entering said vessel containing said dephosphorization slag.

4,457,779
OXIDIZING FLUX FOR SIMULTANEOUS SMELTING/CONVERTING SULFIDES OF HIGH GANGUE CONTENT

Charles Arentzen, Tucson, Ariz., assignor to Atlantic Richfield Company, Los Angeles, Calif.

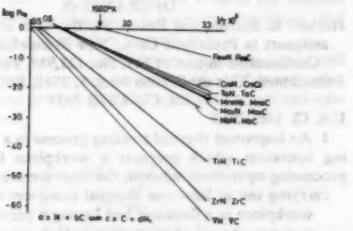
Filed Jul. 18, 1983, Ser. No. 514,470
Int. Cl.³ C22B *15/00, 9/10*
U.S. Cl. 75—72 **19 Claims**

1. A method of producing a metal matte from a charge of a ferruginous sulfide-and gangue-containing metal ore not previously roasted, comprising heating said charge in the presence of an oxidizing flux comprising ferric oxide having the formula, Fe_xO_y, wherein x is less than y, in a reaction chamber in which substantially no oxidation of said sulfide takes place in the absence of an oxidizing flux.

4,457,780
ELECTRIC CONTACT MATERIALS

Mitsuo Osada; Nobuhito Kuroishi; Yoshinari Amano, and Akira Fukui, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 12, 1982, Ser. No. 367,603
Claims priority, application Japan, Apr. 10, 1981, 56-54633; Jul. 10, 1981, 56-108535; Jul. 10, 1981, 56-108536; Jul. 10, 1981, 56-108537; Jul. 15, 1981, 56-110496; Jul. 15, 1981, 56-110497; Jul. 31, 1981, 56-121274; Nov. 13, 1981, 56-181923; Nov. 13, 1981, 56-181929; Nov. 13, 1981, 56-181930; Nov. 13, 1981, 56-181931; Nov. 13, 1981, 56-181932
Int. Cl.³ B22F *3/00*
U.S. Cl. 75—236 **8 Claims**



1. Electric contact material comprising 5–60 weight % of at least one iron group metal, 1–11 weight % of graphite, 5–70 weight % of refractory material, and the residual part consisting essentially of silver, said silver being present in the material in an amount of at least 10 weight %, wherein the refractory material is dispersed in the iron group metal and/or the silver.

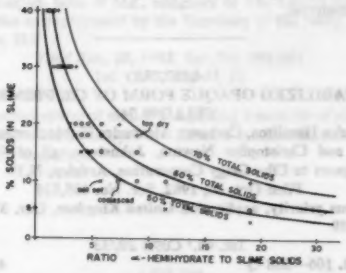
4,457,781
METHOD FOR SOLIDIFYING WASTE SLIME SUSPENSIONS

Jay W. Palmer, Tampa, Fla., and John C. Gaynor, Des Plaines, Ill., assignors to United States Gypsum Company, Chicago, Ill.

Continuation-in-part of Ser. No. 330,550, Dec. 12, 1981, Pat. No. 4,388,292. This application Feb. 18, 1983, Ser. No. 467,891
Int. Cl.¹ B09B *1/00;* C04B *11/00;* C01F *11/46;* C01B *25/16*
U.S. Cl. 106—109 **17 Claims**

1. A method for solidifying colloidal argillaceous matter in suspension in a non-settling aqueous medium to a load bearing solid consisting essentially of:

(a) adding, to a colloidal argillaceous suspension of about 1–40% solids, an effective amount of hydratable calcium sulfate with thorough mixing such that the admixture contains about 45–85 weight % total solids and a weight proportion of hydratable calcium sulfate to argillaceous matter solids on a dry solids basis of from about 1:1 to about 20:1 provided further that at weight proportions of less than about 3:1 the total solids are at least about 50 weight %; and



(b) allowing a substantial portion of the hydratable calcium sulfate in the admixture to hydrate to an interlocking matrix of gypsum crystals having load bearing strength.

4,457,782
COMPOSITION FOR PARTITIONING BLOOD COMPONENTS

Seiichirou Honda, Takarazuka; Hiroshi Ogawara, Ohtsu, and Mutsumi Fukuda, Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 11, 1981, Ser. No. 292,029
Claims priority, application Japan, Aug. 18, 1980, 55-113811; Aug. 28, 1980, 55-119397; May 29, 1981, 56-83050
Int. Cl.³ C08L *91/00;* B01D *12/00*
U.S. Cl. 106—266 **10 Claims**

1. A blood-partitioning composition consisting essentially of a mixture of

(1) a thixotropy-imparting agent which is an inorganic solid powder having an average particle diameter of from 1 to 1,000 millimicrons, a specific surface area of at least 10 m^2/g and a specific gravity in the range of from 1.5 to 3.0;

(2) a first viscous liquid material having strong interaction with the thixotropy-imparting agent such that when the thixotropy-imparting agent is uniformly dispersed with the first viscous liquid and then centrifuged, no localization of said thixotropic agent occurs in the centrifuged liquid, said first viscous liquid having a viscosity at 20° C. of at least 200 centipoises and a specific gravity at 20° of from 0.9 to 1.2, said first material being a natural animal or vegetable oil modified with epoxy groups or a synthetic polymeric material containing carbonyl or epoxy groups in the molecule, and wherein said first material is liquid at room temperature; and

(3) a second viscous liquid material having no strong interaction with the thixotropy-imparting agent such that when the thixotropy-imparting agent is uniformly dispersed with the second viscous liquid material and then centrifuged, the thixotropy-imparting agent is localized in said second viscous liquid, said second viscous liquid having good compatibility with the first viscous liquid material such that no substantial phase separation occurs upon mixing the two liquids, said second liquid material having a viscosity at 20° C. of at least 1,000 centipoises and a specific gravity at 20° C. of 0.85 to 1.20 and being a high-molecular-weight material liquid at room temperature composed substantially only of carbon and hydrogen or a high-molecular-weight material liquid at room temperature composed substantially of carbon, hydrogen and chlorine;

said composition having a specific gravity at 20° C. of from 1.03 to 1.08, a viscosity at a shearing speed of 1 sec^{-1} of from 60,000 to 400,000 centipoises and a thixotropy coefficient of at least 1.8, the amount of said thixotropy-imparting agent being from 2 to 30 parts by weight per 100 parts by the combined

weight of the first and second viscous liquid material, and the amount of said second viscous liquid material being from 20 to 600 parts by weight per 100 parts by weight of the first viscous liquid material.

4,457,783

STABILIZED OPAQUE FORM OF C.I. PIGMENT YELLOW 74

Alexander Hamilton, Cathcart; Alexander H. MacLennan, Paisley, and Christopher Newton, Johnstone, all of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 20, 1982, Ser. No. 435,525

Claims priority, application United Kingdom, Oct. 31, 1981, 81 32859

Int. Cl.³ C09B *29/32*

U.S. Cl. 106—288 Q **4 Claims**

1. A stabilized opaque form of C.I. Pigment Yellow 74 consisting essentially of

(a) 99.0 to 80.0 weight % of C.I. Pigment Yellow 74; and

(b) 1.0 to 20.0 weight % of a monoazo yellow pigment produced by coupling the diazo component derived from one or more of 4-nitro-2-aminoanisole, 4-methyl-2-nitroaniline or 2-methyl-5-nitroaniline with acetoacet-2-anisidide.

4,457,784

GREEN NACREOUS PIGMENTS HAVING CALCINED CR OXIDE AND PHOSPHATE LAYER, THEIR PREPARATION, AND USE

Horst Bernhard, Schwarzenberg, Austria, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,684

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1981, 3137809

Int. Cl.³ C09C *1/00*

U.S. Cl. 106—291 **9 Claims**

1. In a green nacreous pigment comprising a mica platelet coated with a first layer of a metal oxide and a second layer of chromium(III) oxide, wherein the chromium content, calculated as Cr_2O_3, is at least 5% by weight based on the total weight of the pigment, the improvement wherein the chromium oxide layer further contains at least 0.05 mol % of phosphate ion based on the number of moles of chromium(III) ion therein.

4,457,785

TREATED GLASS FIBERS AND NONWOVEN SHEET-LIKE MAT AND METHOD

Edward C. Hsu, Pittsburgh, and Chester S. Temple, McKees Rocks, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 24, 1982, Ser. No. 422,618

Int. Cl.³ C04B *35/80*

U.S. Cl. 106—308 N **14 Claims**

1. Method of dispersing chopped glass fibers in aqueous media, comprising:

(a) adding to the aqueous media in which the glass fibers are to be dispersed about 10 to about 500 parts per million (PPM) of the aqueous media of a blend of a nonionic surfactant and cationic quaternary ammonium salt surfactant where the ratio of the nonionic to cationic surfactant is about 1 to about 99 to about 99 to about 1, and

(b) adding sized or unsized chopped glass fibers to the aqueous media in an amount of about 0.001 to about 3 weight percent of the aqueous media, and

(c) agitating the mixture to produce a dispersion of glass fibers in water.

4,457,786

Patent Not Issued For This Number

4,457,787

INTERNAL OXIDATION METHOD OF AG ALLOYS

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo Kabushiki-Kaisha, Tokyo, Japan

Filed Sep. 21, 1982, Ser. No. 420,740

Int. Cl.³ C22F *1/14*

U.S. Cl. 148—13.1 **9 Claims**

1. Method of promoting the internal oxidation of an Ag alloy containing at least Sn of 3–15 weight % for electrical contact materials and the like, which comprises:

adding other solute metals which sublimate from the alloy in the course of the heat treatment held prior to the internal oxidation to the alloy for the production of vacant lattice points in the alloy with their sublimation from the alloy; and heat treating the alloy in the presence of a reducing gas or neutron prior to the internal oxidation of the alloy, whereby the alloy absorbs the reduction gas or neutron, thereby producing in the alloy vacant lattice points; and thereafter subjecting said alloy to heat in the presence of oxygen to effect the internal oxidation thereof, and during which oxidation step the vacant lattice points work as paths of oxygen and as oxidation nuclei about which Sn is diffused and oxidized.

4,457,788

PARTICULATE MEDIUM FOR FLUIDIZED BED OPERATIONS

Herbert K. Staffin, and Robert Staffin, both of Colonia, N.J., assignors to Procedyne Corp., New Brunswick, N.J.

Continuation-in-part of Ser. No. 121,919, Feb. 15, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,324

Int. Cl.³ C21D *1/53*

U.S. Cl. 148—20.3 **7 Claims**

1. An improved thermal treating process in a metal processing operation which prepares a workpiece for subsequent processing operations wherein the improvement comprises:

carrying out at least one thermal treatment operation on a workpiece in a fluidized bed having a particulate lubricative non-abrasive bed medium which eliminates abrasive damage to the workpiece, minimizes interference with subsequent process operations due to particles from the particulate medium clinging to the workpiece, and lubricates the workpiece.

4,457,789

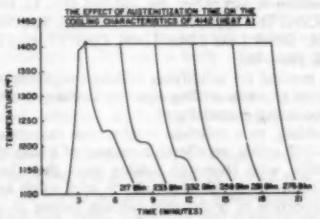
PROCESS FOR ANNEALING STEELS

Gerald W. Wilks, Calumet City, Ill., assignor to LaSalle Steel Company, Hammond, Ind.

Continuation of Ser. No. 093,007, Nov. 9, 1979, abandoned. This application Sep. 1, 1981, Ser. No. 298,384

Int. Cl.³ C21D *6/00*

U.S. Cl. 148—134 **10 Claims**



1. A method for annealing a hypoeutectoid steel which

results in improved ductility, formability, and toughness comprising:

(a) providing a hypoeutectoid steel workpiece,

(b) rapidly heating said workpiece to a temperature above the upper transformation temperature for said steel, maintaining said workpiece at said temperature for a sufficient period of time to cause transformation of ferrite to austenite and the dissolution of substantially all of the carbides but less than that period of time which would cause complete dissolution of said carbides thereby leaving a minor amount of undissolved particulate carbides in said steel sufficient to serve as nuclei for the precipitation of upper transformation products upon cooling,

(c) cooling said workpiece, and

(d) controlling said method to cause a cooling arrest above 1100° F. and precipitation of said upper transformation products.

4,457,790

TREATMENT OF METAL WITH GROUP IV B METAL ION AND DERIVATIVE OF POLYALKENYLPHENOL

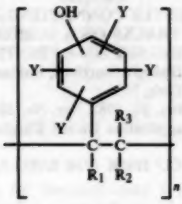
Andreas Lindert, and Jack A. Kramer, both of Troy, Mich., assignors to Parker Chemical Company, Madison Heights, Mich.

Filed May 9, 1983, Ser. No. 490,580
Int. Cl.³ C23F *7/08*
U.S. Cl. 148—6.15 R **20 Claims**

1. An aqueous solution comprising:

from about 0.001% to about 1.0% of a metal ion selected from the group consisting of titanium, zirconium, and hafnium ions and mixtures thereof; and

an effective amount of a soluble or dispersible compound selected from the group consisting of a polymer having the following general formula, acid salts thereof and mixtures thereof:

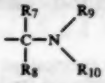


where:

R_1 through R_3 are hydrogen or an alkyl group having from 1 to about 5 carbon atoms;

each Y is hydrogen, Z, $CR_4R_5OR_6$, CH_2Cl, or an alkyl or aryl group having from 1 to 18 carbon atoms;

Z is



R_4 through R_{10} are hydrogen, or an alkyl, aryl, hydroxyalkyl, amino-alkyl, mercapto-alkyl or phospho-alkyl moiety, said R_4 through R_{10} being of carbon chain lengths up to a length at which the compound is not soluble or dispersible; and

n is from 2 up to a number at which the polymer is not soluble or dispersible.

4,457,791

NEW PLASTICIZER FOR NITROPOLYMERS

Robert C. Gill, White Plains, and George W. Nauflett, Fort Washington, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 25, 1982, Ser. No. 391,901
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.3 **8 Claims**

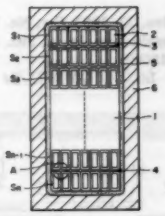
1. A composition of matter comprising a mixture of nitrocellulose and N,N'dimethyl-N,N' dinitro-methanediamine as a plasticizer therefore.

4,457,792

METHOD OF MANUFACTURING A MOLDED COIL

Takashi Chitose, and Teruo Ina, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 319,756, Nov. 9, 1981, abandoned. This application Oct. 25, 1982, Ser. No. 545,582
Claims priority, application Japan, Nov. 12, 1980, 55-159981
Int. Cl.³ H01B *13/08*; H01F *5/06*
U.S. Cl. 156—56 **4 Claims**



2. A method of manufacturing a molded coil, which comprises;

covering a conductor with an insulating tape;

winding said conductor to form a winding which comprises an axially stacked array of disk-shaped conductor layers, said winding having therein a clearance which provides allowance for thermal expansion;

covering said winding with a prepeg resin while preserving said clearance;

heating said prepreg resin for curing it to thereby form a protective cover which will prevent casting resin from filling in said clearance whereby said clearance will permit thermal expansion of said winding conductor within said cover; and

casting a casting resin around said prepreg resin.

4,457,793

METHOD FOR PRODUCING A FIBEROUS BATT

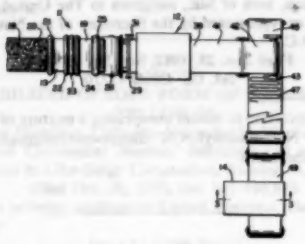
George S. Buck, Jr., Memphis, Tenn., assignor to Fiberlok, Inc., Memphis, Tenn.

Filed Jan. 15, 1982, Ser. No. 339,627
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—62.6 **13 Claims**

1. A completely dry process for producing a fiberous batt comprising the steps of:

l. contacting fibers with an adhesive amount of particles of a copolymer of vinyl chloride and maleic acid dibutyl ester; and

II. forming the fibers into a batt; and
III. heating the batt to a temperature above the melting point



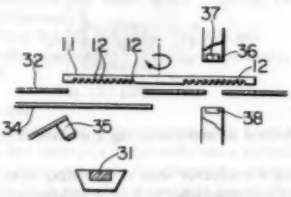
of the copolymer but below the scorching or melting point of the fibers; and then
IV. cooling the batt.

4,457,794

METHOD FOR MANUFACTURING OPTICAL MEMORY DISC

Koichi Kotera, Hyogo, and Takeo Obta, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 23, 1983, Ser. No. 507,155
Claims priority, application Japan, Jun. 25, 1982, 57-110226; Dec. 13, 1982, 57-218609
Int. Cl.³ G01D *15/34*
U.S. Cl. 156—64 **6 Claims**



1. A method for manufacturing an optical memory disc, comprising the steps of, in depositing a recording film on a pregrooved substrate, arranging a photosensor for detecting at least one of exposure amounts of light reflected by and light transmitted through said pregrooved substrate upon radiation of light onto said pregrooved substrate, measuring at least one of total exposure amounts of light reflected by and light transmitted through said pregrooved substrate and said recording film while said recording film is being deposited on said pregrooved substrate, and terminating deposition of said recording film on said pregrooved substrate when said at least one of the total exposure amounts reaches a preset one of total exposure amounts of light reflected by and light transmitted through said pregrooved substrate and said recording film.

4,457,795

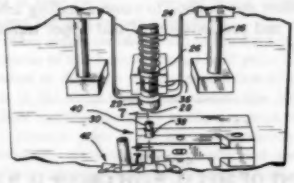
METHOD AND APPARATUS FOR SPIN WELDING SOFT, FLEXIBLE THERMOPLASTICS

Joe Mason, Mundelein; Gerald Noble, Skokie; Hermann Eckert, Palatine, and Steven Tissing, McHenry, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 27, 1982, Ser. No. 370,701
Int. Cl.³ B29C *27/08*
U.S. Cl. 156—73.5 **27 Claims**

1. A method for spin welding together soft and flexible plastic tubes in telescoping relation comprising the steps of:
inserting an end of a second thermoplastic, flexible tube into a lumen of a first thermoplastic, flexible tube and adding a volatile lubricant between said first and second tubes;
chucking said first tube with gripping jaws to define a contacting interface between said tubes;
chucking said second tube at a position axially spaced from said interface with shaping jaws;
rotating at least one of said tubes relative to the other of said tubes to heat and soften said contacting interface; and
ceasing rotation and releasing said second tube from said shaping jaws, whereby said first tube and said second tube are welded together.

20. Apparatus for spin welding together soft and flexible plastic tubes in telescoping relationship comprising:



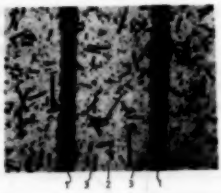
means for inserting an end of a second thermoplastic, flexible tube into a lumen of a first thermoplastic, flexible tube;
gripping jaws for chucking said first tube to form a contacting interface between said tubes, said gripping jaws imparting a substantially circular, cross-sectional shape to said contracting interface;
shaping jaws of polygonal shape for chucking said second tube at a position axially spaced from said interface, said shaping jaws imparting a polygonal, cross-sectional shape to said second tube at said position; and
means for causing relative rotation between said gripping jaws and said shaping jaws to heat and soften said contacting interface of said tubes and to weld said second tube and said first tube together.

4,457,796

PERMANENTLY CONNECTING A SET OF CONDUCTIVE TRACKS ON A SUBSTRATE WITH A CO-OPERATING SET ON A PRINTED CIRCUIT

Barbara Needham, Bishop's Stortford, England, assignor to ITT Industries, New York, N.Y.

Filed Jun. 10, 1982, Ser. No. 386,859
Claims priority, application United Kingdom, Jun. 25, 1981, 8119678
Int. Cl.³ H05K *1/18*; G09G *3/18*
U.S. Cl. 156—182 **6 Claims**



1. A method of making electrical and mechanical connection between a first set of conductive tracks on a non-conductive flexible printed circuit and a second set of co-operating conductive tracks on a rigid substrate, which method comprises:
providing channels on said flexible printed circuit defined by the edges of said first set of conductive tracks,
interposing between the printed circuit and the substrate an excess of an adhesive compound including a dispersion in an electrically insulating adhesive matrix material of not more than 10% electrically conductive fibre fragments

predominently by weight of a length greater than their mean diameter and not significantly greater than the minimum separation of the tracks in the region covered by the adhesive, said mean diameter being less than the depth of said channels and

compressing the printed circuit and the substrate together

to produce a flow of said adhesive compound concentrated along said channels thereby aligning at least the longer ones of said fibre fragments longitudinally in the direction of said channels and minimizing the risk of any fragments bridging adjacent tracks,

to trap at least portions of said fibre fragments between said first and second set of tracks and

to electrically connect each track of said first set of tracks with an associated co-operating track of said second set of tracks by means of the conductive fibre portions compressively trapped therebetween.

4,457,797

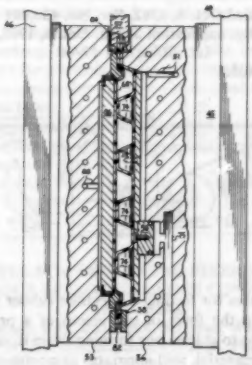
PROCESS FOR THERMOFORMING REINFORCED POLYMER SHEETS

Edward Hatchadoorian; George J. Ostapchenko; James L. Patton, and Harlan S. Young, all of Wilmington, Del., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 355,711, Mar. 8, 1982, abandoned. This application Jun. 21, 1982, Ser. No. 390,683

Int. Cl.³ B29C *11/00, 17/04;* B32B *31/20*

U.S. Cl. 156—242 **22 Claims**



1. In a process for thermoforming a poly(ethylene terephthalate) sheet having a crystallinity of about 0–5% and a thickness of about 0.76–3.2 mm, which is reinforced with a mineral filler and, when so reinforced, has a tensile modulus at 100° C., defined as average of machine direction and transverse direction, within the range of about 7 to 70 MPa, as determinated according to ASTM D-638, preheated to a temperature of about 80°–130° C., at a draw ratio of less than about 1.8, defined as the ratio of the initial sheet thickness to the minimum wall thickness of the thermoformed article, and at a pressure differential of about 200–2000 kPa, in a mold having at least one surface adjacent said sheet of average roughness R_A of about 0.1–0.8 μm,

the improvement, which produces a thermoformed article in which its essentially entire surface in contact with said mold surface has an R_A of about 0.1 to 0.8 μm and the concave optical imperfection index of said surface is less than about 6% of the surface area, as determined by image analysis using a microscope having a magnification of 70 times, comprising the following steps:

(A) removing air from the space between said mold surface and said thermoplastic sheet through at least one vent on the periphery of said mold surface to permit complete contact of said mold surface with said sheet,

(B) while applying air pressure to the backside of said sheet, bringing said sheet, before poly(ethylene terephthalate) crystallinity exceeds about 15%, in complete contact with said mold surface maintained at a temperature of about 130°–180° C., to permit the sheet polymer to completely replicate said mold surface,

(C) maintaining said sheet in contact with the mold at a temperature of 130°–180° C. at least until the sheet polymer reaches a degree of crystallinity sufficient to permit demolding without distortion, and

(D) demolding the thermoformed article.

4,457,798

METHOD OF INCORPORATING IC MODULES INTO IDENTIFICATION CARDS

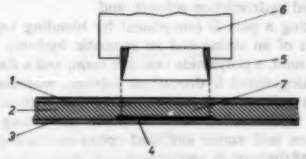
Joachim Hoppe, and Yahya Haghiri-Tehrani, both of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation and Organisation mbH, Munich, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,955

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1981, 3122981

Int. Cl.³ B32B *31/18*

U.S. Cl. 156—248 **10 Claims**



1. A method of producing an identification card which includes a carrier element and an embedded IC module thereon, wherein said card has a recess and said carrier element is positioned within said recess, said identification card further comprising at least one card inlay having at least one cover film laminated thereon, said method comprising:

(a) positioning at least one separation layer between one cover film and said card inlay layer, said separation layer comprising means for preventing said one cover film and said card inlay from sticking together during lamination of said card inlay and said at least one film into an assembly;

(b) laminating said at least one film to said card inlay layer by applying heat and pressure to said assembly;

(c) forming a recess in said assembly to provide room for inserting said carrier element into said assembly by cutting a hole in said assembly to the depth of said separation layer;

(d) removing the cut portion from said assembly together with at least a portion of said separation layer; and

(e) inserting said carrier element into said recess and adhering said carrier element to a surface of said recess.

4,457,799

BONDING ELASTOMERS

John R. Dunn, Sarnia, Canada, assignor to Polysar Limited, Ontario, Canada

Continuation-in-part of Ser. No. 357,748, Mar. 12, 1982, abandoned. This application Feb. 17, 1983, Ser. No. 467,341

Int. Cl.³ B32B *31/26*

U.S. Cl. 156—307.1 **9 Claims**

1. An improved method of bonding a layer of a fluoroelastomer compound to a layer of a butadiene-acrylonitrile polymer compound, said fluoroelastomer compound containing a fluoroelastomer based on vinylidene fluoride and hexafluoropro-

pylene optionally also containing tetrafluoroethylene, perfluoromethylvinyl ether or ethylenically unsaturated olefins, and containing one or more inorganic acid acceptors selected from magnesium oxide, cadmium oxide, calcium oxide, calcium hydroxide and zinc oxide, wherein the improvement is the incorporation into each of the fluoroelastomer compound and the butadiene-acrylonitrile polymer compound from about 1 to about 3 parts by weight per 100 parts by weight of the fluoroelastomer and of the butadiene-acrylonitrile polymer of a polysulphidic silane compound prior to bonding the two layers together and vulcanizing the layers in contact with each other.

4,457,800

STABILIZATION OF EPOXY SYSTEMS IN NON-FLAMMABLE SOLVENTS

Ralph M. Schure, Darien, and Gerald H. Steele, Lisle, both of Ill., assignors to Eschem Inc., Chicago, Ill.

Division of Ser. No. 277,903, Jun. 26, 1981, now Pat. No. 4,388,426. This application Jan. 31, 1983, Ser. No. 463,531

Int. Cl.³ C09J *5/02*; C08K *5/02*

U.S. Cl. 156—307.3 **18 Claims**

1. A method for preparing a laminating adhesive composition having a part A component and a part B component, both of which are flame-resistant, comprising the steps of:

preparing a part A component by blending together an epoxy-containing reactive resin and a flame-resistant halogenated hydrocarbon solvent; and

formulating a part B component by blending together an adduct of an amine and an aromatic hydroxy or epoxy compound, a polyamide reactive resin, and a flame-resistant halogenated hydrocarbon solvent, wherein said adduct is resistant to reaction of said amine with said halogenated hydrocarbon solvent while permitting reaction between said amine and said epoxy-containing reactive resin of the part A component.

4,457,801

LABELING STATION FOR ARTICLES LIKE BOTTLES

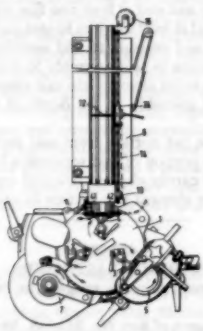
Rudolf Zodrow, Düsseldorf, Fed. Rep. of Germany, assignor to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 14, 1983, Ser. No. 466,278

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1982, 3205414; Apr. 3, 1982, 3212509

Int. Cl.³ B65C *9/10*, *9/16*

U.S. Cl. 156—364 **20 Claims**



1. In a labeling station for articles like bottles comprising at least one pivoting or swiveling extractor with a pickup surface that is convex, means for coating the extractor with an adhesive, means for rocking the extractor over or for rolling it across the front of a stack of labels in a magazine, the adhesive picking up one label at a time from the stack, means holding the magazine in place and having a portion extending in front of the stack, the pickup surface of the extractor having recesses aligned with the portion of the holding means so that the surface can rock unimpeded across the front of the stack, the improvement wherein the holding means comprises means movable from a first inoperative position into a second position in front of the stack of labels for exerting pressure on the stack, wherein the recesses in the pickup surface are aligned with the pressure exerting means when in the second position to allow the pickup surface to rock unimpeded, and further comprising control means for moving the pressure exerting means between the first and second positions only in the intervals between removals.

4,457,802

APPARATUS FOR CONVEYING AND SHAPING RUBBER SHEET MATERIALS

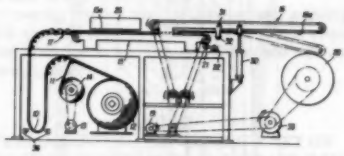
Toshio Yanagihara, Kobe, and Tsunekichi Tominaga, Urawa, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 6, 1982, Ser. No. 433,081

Claims priority, application Japan, Oct. 6, 1981, 56-159582

Int. Cl.³ B29H *17/00*

U.S. Cl. 156—405.1 **7 Claims**



1. An apparatus for feeding a sheetlike rubber material one after another in the form of cut pieces of a predetermined length and shape to at least one forming drum from a stock roll of said rubber material, said apparatus comprising:

a first transfer member having a conveying surface on an upper side thereof;

a second transfer member having a conveying surface on an underside thereof and which is disposed in series and lapped relation with said first transfer member so as to form a gap therebetween slightly greater than a thickness of said rubber material and wherein said forming drum is located in front of a fore end portion of said second transfer mechanism;

a drive system for driving said first and second transfer members in relation to rotation of said forming drum;

a cutter located across said first transfer member for cutting a piece of said rubber material on the conveying surface of said first transfer member along a predetermined cutting line;

said lapped portions of said first and second transfer members being positioned so as to transfer said cut piece along a line conforming with said cutting line; and

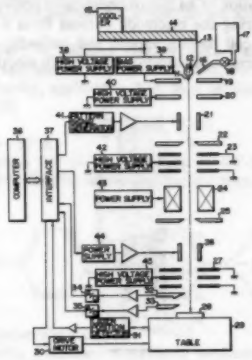
means for rocking said second transfer member except for said lapped portion toward said forming drum for bringing a transferred cut piece of said rubber sheet into a position suitable for wrapping said cut piece around a circumference of said drum.

4,457,803

PROCESSING METHOD USING A FOCUSED ION BEAM

Tadahiro Takigawa, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 8, 1982, Ser. No. 447,762
Claims priority, application Japan, Dec. 18, 1981, 56-205016
Int. Cl.[3] H01L *21/306;* B44C *1/22;* C03C *15/00;* C23F *1/02*
U.S. Cl. 156—626 4 Claims



1. A processing method using a focused ion beam, which uses a focused ion beam radiation apparatus comprising an ion gun and an ion optical system for producing a micro ion beam, a deflecting device for scanning the ion beam on a surface of a wafer, a blanking device for blanking the ion beam, and a control device for controlling said devices, thereby etching the wafer by irradiation thereof with the focused ion beam, comprising the steps of:

determining a desired etching depth of the wafer as a function of a location and presetting data of the etching depth in said control device; and

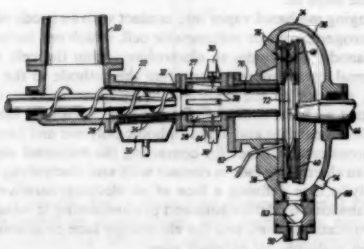
controlling said blanking device in accordance with said data so as to vary a radiation time of the ion beam.

4,457,804

APPARATUS FOR PRODUCING FIBER PULP FROM FIBROUS LIGNOCELLULOSE CONTAINING MATERIAL

Rolf B. Reinhall, P.O. Box 3847, Bellevue, Wash. 98009

Division of Ser. No. 160,253, Jun. 17, 1980, Pat. No. 4,283,252. This application Jan. 12, 1981, Ser. No. 223,986
Claims priority, application Sweden, Mar. 19, 1976, 76034644
Int. Cl.[3] D21D *1/30*
U.S. Cl. 162—254 3 Claims



1. In an apparatus for refining thermomechanical pulp, in which wood chips are ground in a grinding space defined between a pair of grinding discs which rotate relatively to one another under axial pressure within a defibrating housing in an environment of steam of superatmospheric pressure and elevated temperature above 100° C., the wood chips being conveyed through inlet conduit means in the grinding housing into a central opening between the grinding discs, from which the material is propelled radially outwards into the grinding space by the centrifugal force created by the rotating discs, the resultant ground pulp material being discharged therefrom through valve means which are controlled to maintain a predetermined pressure and temperature within the housing, the improvement in said apparatus providing enhanced fibrillation with reduced energy consumption, comprising:

(a) means for advancing said chips while progressively compressing them into a continuous steam-tight plug at said central opening during the passage of said chips through said inlet conduit means to seal the housing against blow-back of pressurized steam into said passage;

(b) said inlet conduit means having an upstream end and a downstream end;

(c) said upstream end having means for dewatering the chips as said steam-tight plug is advanced into said central opening;

(d) said downstream end terminating in and forming said central opening;

(e) vanes located on the grinding disc opposite the incoming plug for breaking up said steam-tight plug into fiber material before it is propelled into said grinding space and:

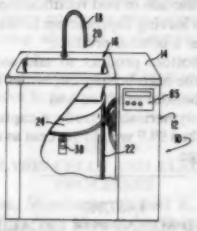
(f) means for controlling the pressure and temperature of said environment of steam.

4,457,805

SOLVENT RECOVERY APPARATUS AND METHOD

Manuel G. Pastor, Berkeley, Calif., assignor to Zerpa Industries, Inc., San Jose, Calif.

Continuation of Ser. No. 250,798, Apr. 3, 1981, abandoned. This application Apr. 22, 1983, Ser. No. 485,496
Int. Cl.[3] B01D *3/02*
U.S. Cl. 202—83 14 Claims



1. In a solvent recovery apparatus having means for providing a distilling mode and means for providing an emptying mode, the improvement comprising:

a tank;

means for heating the interior of said tank;

a plastic bag; and

means for mounting said plastic bag within said interior, said means for mounting being designed, positioned and dimensioned for forming a substantially liquid-tight barrier between contaminated solvent within said plastic bag and said means for heating during said distilling mode, and for enabling easy removal and disposal of said plastic bag when containing a substantial quantity of residue remaining from the evaporation of said contaminated solvent during the emptying mode.

4,457,806
PROCESS FOR VINYL AROMATIC MONOMER POLYMERIZATION INHIBITION

John C. Grivas, Oak Lawn, and Myong-Gi A. Park, Dolton, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Jun. 28, 1982, Ser. No. 393,005
Int. Cl.³ B01D 3/34; C07C 7/05, 7/20
U.S. Cl. 203—9 10 Claims

1. A process for distilling a polymerizable vinyl aromatic monomer which comprises subjecting the vinyl aromatic monomer to distillation temperatures in the presence of effective amounts of polymerization inhibitors consisting of mixtures of 2,6-dinitro-4-ethylphenol and 2,6-dinitro-paracresol; wherein the dinitro-4-ethylphenol is present in amounts ranging from about 1% to 99% by weight of the mixture.

4,457,807
PROCESS FOR THE PURIFICATION OF ε-CAPROLACTAM

Peter F. M. Rulkens; Nicolaas F. Haasen, both of Sittard, and Otto G. Plantema, Nederweert, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed May 7, 1982, Ser. No. 376,001
Claims priority, application Netherlands, May 9, 1981, 8102280
Int. Cl.³ B01D 3/10, 3/14
U.S. Cl. 203—72 6 Claims

1. A process for purifying a dehydrated ε-caprolactam product obtained by rearrangement of cyclohexanone oxime in the presence of sulfuric acid or oleum by distilling said caprolactam under reduced pressure to separate out low-boiling and high-boiling impurities from said caprolactam to yield a very pure polymerizable grade ε-caprolactam product, said process comprising the combination of steps of:

A. conducting said distillation of untreated ε-caprolactam in a first and in a second stage wherein said first stage and said second stage each includes an evaporator and a rectification column containing packing material such that the pressure drop across each theoretic tray in the respective rectification columns is less than about 2.5 mbar;

B. supplying said impure caprolactam to said rectification column in said first stage;

C. separating out as a top product the low-boiling impurities from said caprolactam in said rectification column in said first stage while leaving caprolactam containing high-boiling impurities as a bottom product;

D. feeding said bottom product to said second stage and separating out the high-boiling impurities from the caprolactam in said bottom product; and

E. recovering polymerizable grade ε-caprolactam having purity greater than 99.9 weight percent as a top product in said second stage.

4,457,808
METHOD AND MEANS FOR RECALIBRATING ELECTROCHEMICAL CELLS IN SITU

Robert M. Taylor, Lansdale, and William C. Wiley, Conshohocken, both of Pa., assignors to General Signal Corporation, Stamford, Conn.

Filed May 16, 1983, Ser. No. 495,302
Int. Cl.³ G01N 27/46
U.S. Cl. 204—1 T 17 Claims

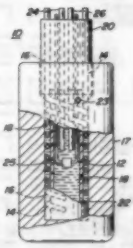
1. A method for in situ recalibration of a system for measuring the concentration of an electrochemically active species in a fluid by measuring the electrode current from a Ross type electrochemical cell having anodic and cathodic measuring electrodes, a reference electrode, and a fourth electrode, comprising the steps of:

adjusting the sensitivity of said system at a certain time so that the measured value of said species corresponds to that of a known sample being measured;

measuring the transient response of said cell under said known sample conditions and at a subsequent time under unknown sample conditions in response to the injection of current into said fourth electrode; and

readjusting the sensitivity of said system at said subsequent time in accordance with changed in the value of said transient response between said certain time and sdid subsequent time.

6. Apparatus for in situ recalibration of a system for measuring the concentration of an electrochemically active species in a fluid by measuring the electrode current from a Ross type electrochemical cell having anodic and cathodic measuring electrodes, a reference electrode, and a fourth electrode, comprising:



means for adjusting the sensitivity of said system at a certain time so that the measured value of said species corresponds to that of a known sample being measured:

means for measuring the transient response of said cell under said known sample conditions and at a subsequent time under unknown sample condition in response to the injection of current into said fourth electrode; and

means operable to readjust the sensitivity of said system at said subsequent time in accordance with changes in the value of said transient response between said certain time and said subsequent time.

4,457,809
METHOD FOR OXIDIZING LOWER ALKANOLS TO USEFUL PRODUCTS

Thomas M. Meshbesher, 4507 Weldin Rd., Wilmington, Del. 19803

Continuation-in-part of Ser. No. 199,939, Oct. 23, 1980, Pat. No. 4,347,109, which is a continuation-in-part of Ser. No. 151,254, May 19, 1980, abandoned. This application Aug. 3, 1982, Ser. No. 404,815
Int. Cl.³ C25B 3/02, 8/00
U.S. Cl. 204—59 R 4 Claims

1. A method for making formaldehyde from methanol comprising the steps of:

(a) bringing methanol vapor into contact with an anode of an electrogenerative or voltameiotic cell, which cell includes the anode, a cathode, an electrolyte within the cell, and external circuit means connecting the cathode to the anode, exterior to the cell; and bringing an oxidant into contact with the cathode; said anode comprising a metallic electrocatalyst and a hydrophobic polymer and having a porous catalytic face for contacting the methanol vapor and an electrolyte face in contact with said electrolyte, the catalytic face defining a face of an electrogenerative or voltameiotic oxidation zone and predominating in metallic electrocatalyst sites, and the electrolyte face predominating in hydrophobic polymer sites;

(b) anodically treating the methanol vapor by electrogenerative or voltameiotic oxidation in said oxidation zone, thereby forming gaseous formaldehyde in said oxidation zone;

(c) conveying a major amount of the resulting gaseous formaldehyde out of said oxidation zone, while the formalde-

hyde is in gaseous form and before it is hydrated with water or oxidized to formic acid or formate.

4,457,810

4,4'-DIPHENYL ETHER-DIALDEHYDE-BIS-DIMETHYLACETAL AND A PROCESS FOR ITS PREPARATION

Detlef H. Skaletz, Mainz, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

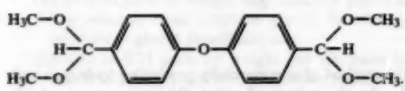
Division of Ser. No. 333,013, Dec. 21, 1981, Pat. No. 4,405,816. This application Aug. 27, 1982, Ser. No. 412,246

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3048992

Int. Cl.³ C25C *1/00*

U.S. Cl. 204—59 R **8 Claims**

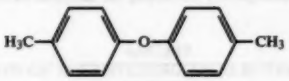
1. A process for the preparation of 4,4'-diphenyl ether-dialdehyde-bis-dimethylacetyl having the formula



VII

which comprises the steps of:

(a) providing a mixture comprising methanol, a supporting electrolyte, and di-p-tolyl ether of the formula



(b) anodically oxidizing said di-p-tolyl ether in said mixture using a current conversion of between about 8 and 12 Faradays/mole of said di-p-tolyl ether.

4,457,811

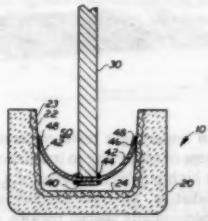
PROCESS FOR PRODUCING ELEMENTS FROM A FUSED BATH USING A METAL STRAP AND CERAMIC ELECTRODE BODY NONCONSUMABLE ELECTRODE ASSEMBLY

Stephen C. Byrne, Monroeville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 20, 1982, Ser. No. 451,073

Int. Cl.³ C25B *1/00*; C25C *3/04, 3/06, 3/26*

U.S. Cl. 204—60 **25 Claims**



14. A process for producing an element selected from the group consisting of aluminum, lead, magnesium, zinc, zirconium, titanium and silicon by electrolytic reduction of a compound comprised of such element dissolved in a molten salt, said process including providing a nonconsumable electrode assembly by the steps of:

providing a ceramic electrode body;

providing a subassembly comprised of a metal conductor rod having a portion of at least one metal strap affixed to an end of the rod, the strap having opposing portions extending radially outwardly from the rod axis and the strap adapted to provide a space between said ceramic body and the strap portion affixed to the rod end, the space sufficient to avoid contact between said ceramic body and the strap portion affixed to the rod end during said process; and

providing means for attaching portions of the strap to said ceramic body.

4,457,812

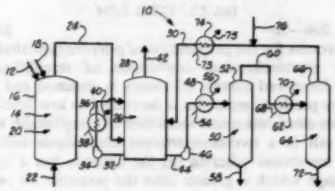
CRITICAL SOLVENT SEPARATIONS IN INORGANIC SYSTEMS

Theodore A. Rado, Oklahoma City, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Jul. 18, 1983, Ser. No. 514,499

Int. Cl.³ C25C *1/02, 1/06, 1/16, 1/18*

U.S. Cl. 204—66 **35 Claims**



1. A process for separating metallic halides from a mixture comprising metallic halides, the process comprising:

contacting said mixture with a near-supercritical inorganic fluid having a critical temperature between about 100 degrees centigrade and about 500 degrees centigrade and comprising the same halide as the metallic halides to be separated from the mixture and preferentially taking up at least one metallic halide at the contacting conditions of near-supercritical temperature and pressure such that the near-supercritical inorganic fluid takes up at least a portion of at least one metallic halide forming a near-supercritical fluid phase;

segregating the near-supercritical fluid phase from any of the mixture not taken up by the near-supercritical fluid while still maintaining aforesaid near-supercritical conditions; and

separating at least a portion of at least one of said taken-up metallic halides from the near-supercritical fluid phase.

4,457,813

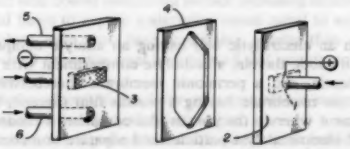
ELECTROLYSIS CELLS AND ELECTROLYTIC PROCESSES

Thomas E. Rogers, Manchester; Robert E. Jansson, Chesterfield, both of Mo., and Manuel M. Baizer, Santa Barbara, Calif., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 4, 1983, Ser. No. 472,354

Int. Cl.³ C25B *3/00, 3/02*

U.S. Cl. 204—74 **10 Claims**



1. A process of carrying out useful electrolytic reactions

simultaneously at an anode and cathode which comprises supplying a catholyte containing a compound to be reduced electrolytically to a cathode in a diaphragmless cell, supplying an anolyte containing a compound to be oxidized electrolytically to the anode in said cell, while imposing an electric current on said anode and cathode of said cell in an amount, rate and location of said cell sufficient to prevent the anolyte from substantially contacting the cathode and to prevent substantially the catholyte from from contacting the anode, and effecting oxidation of the said compound to be oxidized and reduction of the said compound to be reduced in separate useful simultaneous electrolytic reactions.

4,457,814

PROCESS FOR ELECTROCHEMICAL REDUCTION OF TEREPHTHALIC ACID

John A. Donohue, Elmhurst, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 29, 1983, Ser. No. 518,392
Int. Cl.³ C25B *3/04*
U.S. Cl. 204—75 **21 Claims**

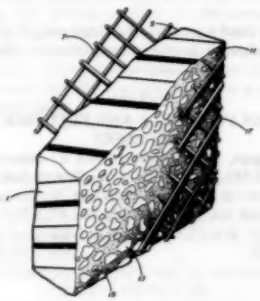
1. A process for the preparation of p-hydroxymethylbenzoic acid by electrochemical conversion of terephthalic acid wherein improved current efficiency is obtained and production of by-product impurities is decreased to low levels which comprises electrochemical reduction of terephthalic acid as a sodium salt in a two-compartment electrolysis cell with a suitable membrane wherein (a) the cathode has a hydrogen overvoltage which is greater than the potential for reduction of terephthalic acid to p-hydroxymethylbenzoic acid, (b) pH of the catholyte solution is within the range of from about 6 to about 11, (c) said catholyte comprises a solvent, a solution of terephthalic acid and a soluble sodium salt wherein the ratio of moles of sodium to moles of terephthalic acid is from about 1:1 to about 2:1, and (d) said electrochemical reduction is in the presence of a soluble buffer.

4,457,815

ELECTROLYTIC CELL, PERMIONIC MEMBRANE, AND METHOD OF ELECTROLYSIS

Mark Levin, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 9, 1981, Ser. No. 328,883
Int. Cl.³ C25B *11/04, 9/04*
U.S. Cl. 204—98 **63 Claims**



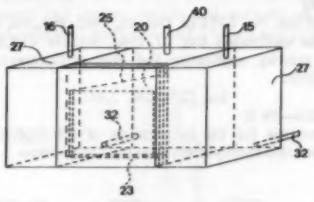
1. In an electrolytic cell having an anolyte compartment with an anode therein, a catholyte compartment with a cathode therein, and a permionic membrane therebetween, the permionic membrane having a porous film thereon, the improvement wherein the porous film comprises a random mixture of electrocatalyst particles and separate non-conductive surface catalyst particles, said electrocatalyst particles having an electrical conductivity of more than 10 ohm-centimeters)$^{-1}$, and said particles being hydrophillic.

4,457,816

ELECTROLYSIS METHOD FOR DECOMPOSING WATER INTO HYDROGEN GAS AND OXYGEN GAS

Daniel T. Galluzzo, Jarrettsville, Md., and Charles L. Dumler, Kent, Wash., assignors to Hydor Corporation, Baltimore, Md.

Continuation of Ser. No. 210,336, Nov. 25, 1980, Pat. No. 4,369,102. This application Jan. 17, 1983, Ser. No. 458,715
Int. Cl.³ C25C *1/00*; C25B *1/06, 11/02*; C02F *1/46*
U.S. Cl. 204—105 R **13 Claims**



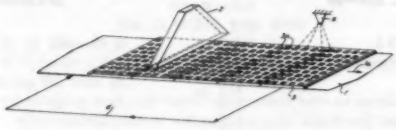
1. In the method of commercially producing hydrogen and oxygen by the electrolysis of water, the improvement which comprises the steps of providing an electrolytic apparatus, feeding sea water directly into the apparatus without prior distillation thereof, collecting the hydrogen and oxygen produced, simultaneously precipitating out minerals from the water, and subsequently extracting the minerals from the apparatus.

4,457,817

METHOD OF TREATING HIGH-POLYMER MATERIALS

Wolfgang Bobeth; Adolf Heger, and Helmar Pässler, all of Dresden, German Democratic Rep., assignors to Forschungs Institut für Textiltechnologie, German Democratic Rep.

Continuation of Ser. No. 579,815, May 12, 1975, abandoned, which is a continuation of Ser. No. 397,248, Sep. 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 76,070, Sep. 28, 1970, abandoned. This application Jul. 25, 1977, Ser. No. 818,577
Int. Cl.² C08F *255/02, 265/08, 283/02*
U.S. Cl. 204—159.15 **7 Claims**



1. A method of imparting a textured structure to a textile comprising the steps of subjecting to irradiation a textile which is composed of a high-polymer material of a type that can be activated by irradiation, the said irradiation being directed against selected horizontally spaced regions, and

contacting the material with a polymerizable monomeric vinyl treating medium, thereby causing grafting of said treating medium upon the high-polymer material in said irradiated regions, resulting in shrinkage or increased shrinkage of the irradiated regions relative to the non-irradiated regions, the size of the individual irradiated and non-irradiated regions being large enough to cause a different ornamental effect of the two types of regions, thus resulting in a texturing effect in the textile by alternating high and low profile areas.

4,457,818
DENTAL COMPOSITIONS FROM URETHANE ACRYLATE, DIACRYLATE MONOMER, CAMPHORQUINONE AND DIMETHYLAMINOETHYL METHACRYLATE

Robert Denyer, Macclesfield, and Michael S. Fortuin, Middlesbrough, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Dec. 4, 1979, Ser. No. 100,039
Claims priority, application United Kingdom, Dec. 18, 1978, 48967/78; Apr. 4, 1979, 7911709
Int. Cl.³ A61K 5/02; C08F 2/50
U.S. Cl. 204—159.19 1 Claim

1. A liquid dental composition which comprises

(A) 50 to 55 parts by weight of polymerisable vinyl urethane prepolymer which is the reaction product of a urethane prepolymer derived from the reaction of hexamethylene diisocyanate and propoxylated bisphenol A, and hydroxypropyl methacrylate,

(B) 50 to 45 parts by weight of at least one glycol methacrylate selected from ethylene glycol dimethacrylate and triethylene glycol dimethacrylate,

(C) 0.25 to 0.75 parts by weight per 100 parts by weight A+B of dimethylaminoethyl methacrylate, and

(D) 0.5 to 1.0 parts by weight per 100 parts by weight A+B of camphorquinone.

4,457,819
METHOD OF DELUSTERING AN ELECTROCOATED ARTICLE

Hisao Kirino; Yukinobu Yabumoto; Takashi Iritani; Masao Suga, all of Funabashi; Yukinaga Nakanishi, Yokohama, and Masaru Itoh, Miura, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka and Nippon Light Metal Company Ltd., Tokyo, both of, Japan

Filed Dec. 28, 1982, Ser. No. 453,958
Claims priority, application Japan, Dec. 28, 1981, 56-214419
Int. Cl.³ C25D 13/00, 13/04
U.S. Cl. 204—181 R 12 Claims

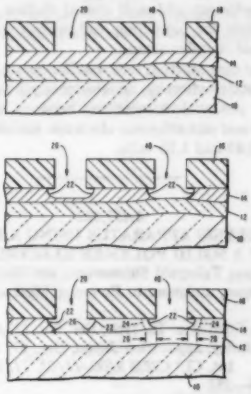
10. A method of controlling gloss of an electrocoated article, which comprises electrocoating an article while applying pulsating electric current voltage to the article, dipping the resultant electrocoated article into an aqueous solution of an organic sulfonic acid while the electrocoated article is in an uncured state, applying direct electric current or pulsating electric current to the electrocoated article as anode, removing the electrocoated article from the solution, and baking the electrocoated article.

4,457,820
TWO STEP PLASMA ETCHING

Steven F. Bergeron, Jericho, and Bernard F. Duncan, Westford, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1981, Ser. No. 334,181
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 E 10 Claims

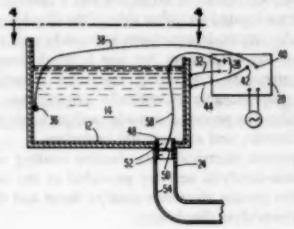
1. An improved method of etching at least two openings in a given material on a substrate of a different material wherein said given material has a variable thickness at the locations to be etched, comprising the steps of first isotropically etching the regions to be etched, detecting the initial end point at which a portion of said material is completely etched away at some location to expose the surface of said different material at said location, and thereafter anisotropically etching the remainder of said given material until it has been completely removed from all of the etch locations.



4,457,821
CATHODIC PROTECTION APPARATUS FOR WELL COATED METAL VESSELS HAVING A GROSS BARE AREA

Leon P. Sudrabin, Berkeley Heights, and Paul Kaiser, Union, both of N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 17, 1983, Ser. No. 458,390
Int. Cl.³ C23F 13/00
U.S. Cl. 204—196 10 Claims



1. Cathodic protection apparatus for a metal vessel containing a corroding electrolyte therein, said vessel having a well coated containing surface and at least one gross bare area in direct metallic contact with said metallic vessel, said gross bare area defining a confined conductive path for said electrolyte, said apparatus comprising

an uncoated inlet-outlet pipe defining said gross bare area, said well coated containing surface including minute pores and flaws to expose underlying vessel metal to said electrolyte, said gross bare area being greater than at least about 5 times the total bare area of said minute pores and flaws,

a tubular electrical insulator of non-metallic material received within said inlet-outlet pipe,

an anode centrally disposed within said tubular insulator and electrically insulated from said vessel and said inlet-outlet pipe,

rectifier means disposed exteriorly of said vessel for supply-

ing direct current to said anode for providing a protective current circuit to said vessel,

a saturated copper-copper sulfate reference electrode disposed adjacent said well coated surface and within said electrolyte for regulating said protective current circuit with said rectifier means,

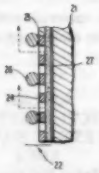
said direct current from said rectifier means impressed upon said anode whereby an electronegative vessel-to-electrolyte potential as measured between said well coated surface and said reference electrode is maintained between about 0.85 and 1.10 volts.

4,457,822

ELECTROLYSIS APPARATUS USING A DIAPHRAGM OF A SOLID POLYMER ELECTROLYTE

Hiroshi Asano; Takayuki Shimamune, and Toshiki Goto, all of Chiba, Japan, assignors to Permelec Electrode Ltd., Tokyo, Japan

Filed Dec. 18, 1980, Ser. No. 217,608
Claims priority, application Japan, Dec. 27, 1979, 54-169406
Int. Cl.³ C25B *9/00, 11/03, 11/10*
U.S. Cl. 204—252 **8 Claims**



1. An electrolysis apparatus comprising

a diaphragm of a solid polymer electrolyte wherein the solid polymer electrolyte is an ion exchange membrane,

and

an anode electrode structure and a cathode electrode structure located on either side of the diaphragm, at least one of the electrode structures intimately contacting the surface of the diaphragm but not bonded thereto, wherein the intimately contacting electrode structure comprises a gas-permeable electrically conductive substrate and a film-like porous electrode catalyst layer bonded integrally thereto, and additionally including

a porous electrically conductive coating with substantially non-catalytic activity provided in the interface between the porous electrode catalyst layer and the solid polymer electrolyte diaphragm.

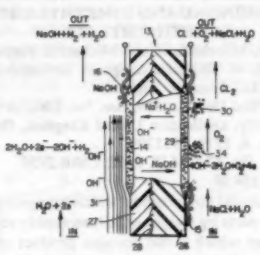
4,457,823

THERMALLY STABILIZED REDUCED PLATINUM OXIDE ELECTROCATALYST

Anthony B. LaConti, Lynnfield; Russell M. Dempsey, Hamilton, and Thomas G. Coker, Waltham, all of Mass., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 931,419, Aug. 7, 1978, abandoned. This application Jan. 19, 1981, Ser. No. 225,940
Int. Cl.³ C25B *13/00*; C25C *7/04*
U.S. Cl. 204—282 **16 Claims**

1. In a combination membrane and electrode structure for electrolytic production of halogens comprising a gas and hydraulically impervious polymeric ion transporting membrane having at least one gas and liquid permeable catalytic electrode bonded to a surface of the membrane to form a unitary electrode membrane structure, the improvement which comprises a bonded electrode including partially reduced oxides of at least one platinum group metal taken from the group consisting of platinum, iridium, ruthenium, paladium, and osmium and alloys thereof and optionally containing graphite heated in the



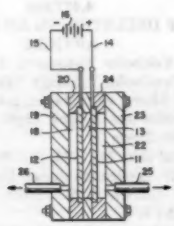
presence of oxygen at a temperature high enough to stabilize the reduced oxides thermally against corrosion.

4,457,824

METHOD AND DEVICE FOR EVOLUTION OF OXYGEN WITH TERNARY ELECTROCATALYSTS CONTAINING VALVE METALS

Russell M. Dempsey, Hamilton; Anthony R. Fragala, North Andover; Anthony B. LaConti, Lynnfield, and John F. Enos, Peabody, all of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 28, 1982, Ser. No. 368,254
Int. Cl.³ C25B *1/10, 11/06*
U.S. Cl. 204—290 F **3 Claims**



1. A catalytic oxygen-evolving anode electrode structure consisting of:

(a) a conductive substrate of a metal which passivates under anodic conditions or in the presence of oxygen,

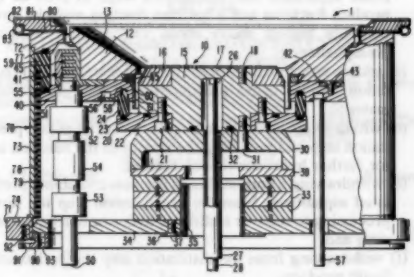
(b) a catalytic layer deposited over the surface of the substrate, said catalytic layer comprising a ternary catalyst consisting of at least two (2) platinum group metal-containing compounds and at least one (1) passivatable valve metal-containing compound selected from the group consisting or titanium, tantalum, niobium, zirconium, hafnium, vanadium and tungsten, said ternary catalyst being characterized by long-term operating stability with the overvoltage of said ternary catalyst with time not exceeding 20 mv/1000 hrs. of operation at current densities at least up to 1000 amp/ft^2,

(c) the passivatable valve metal-containing compound of the ternary catalyst comprising about 0.5 to 50 weight percent based upon the weight of the catalyst and the total platinum group metal-containing compounds of the ternary catalyst comprising about 99.5 to 50.0 weight percent based upon the weight of the catalyst, the platinum group metal-containing compounds having about 99.5 to 0.5 weight percent of one platinum group metal-containing compound based upon the weight of the platinum group metal compounds, with the balance of the platinum group metal compounds being at least one other platinum group metal containing compound.

4,457,825
SPUTTER TARGET FOR USE IN A SPUTTER COATING SOURCE

Lawrence T. Lamont, Jr., Mountain View, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed May 16, 1980, Ser. No. 150,532
Int. Cl.³ C23C 15/00
U.S. Cl. 204—298 5 Claims



1. A sputter target for use in sputter coating apparatus, said target comprising:

an annular target member having a cross sectional shape comprising a front surface from which material is to be sputtered, an outer rim and an inner rim, and a back surface generally opposite said front sputter surface;

said outer rim having a first portion intersecting said back surface and a second portion intersecting said front sputter surface, and said second portion extends outwardly from said first portion, and

said outer rim being substantially longer in a direction parallel to the axis of said annular target member than is said inner rim, whereby said target is substantially thicker at said outer rim that at said inner rim.

4,457,826
PREVENTION OF DELETERIOUS DEPOSITS IN A COAL LIQUEFACTION SYSTEM

Norman L. Carr, Allison Park; Michael E. Prudich, Pittsburgh; William E. King, Jr., Gibsonia, and William G. Moon, Cheswick, all of Pa., assignors to The Pittsburg & Midway Coal Mining Co., Englewood, Colo.

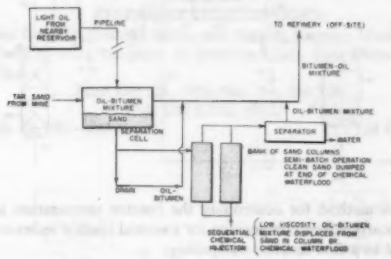
Filed Jan. 26, 1982, Ser. No. 341,547
Int. Cl.³ C10G 1/00, 1/06
U.S. Cl. 208—8 LE 10 Claims

1. A coal liquefaction process for reducing deleterious reaction zone deposits, which process comprises passing hydrogen and a feed slurry comprising feed coal and recycle liquid solvent to a non-packed coal liquefaction reaction zone, said feed slurry is reacted in said coal liquefaction zone under a temperature in the range of between about 430° to about 470° C., a hydrogen partial pressure of at least about 1500 psig, for a total slurry residence time of from about 0.5 to about 2 hours, and imparting a critical mixing energy of at least about 3500 ergs per cubic centimeter of reaction zone volume per second to said feed slurry in said reaction zone, thereby causing hydrogen transfer from the gaseous phase to the slurry in amounts adequate to prevent hydrogen starvation of said slurry and substantially prevent formation of deleterious cementitious coke deposits.

4,457,827
PROCESS FOR EXTRACTING BITUMEN FROM TAR SANDS

Harold S. Chung, Dallas, Tex., and Joseph J. Dickert, Jr., Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 242,217, Mar. 10, 1981, abandoned. This application May 18, 1983, Ser. No. 495,568
Int. Cl.³ C10G 1/04
U.S. Cl. 208—11 LE 5 Claims



1. A process for the recovery of bitumen from mined tar sands that comprises the steps of:

(i) admixing mined tar sands with a light crude oil or a mixture of light crude oils, whereby a portion of the bitumen is dissolved in said crude oil or oils and a portion of said crude oil or oils is dissolved in bitumen remaining on said tar sands, thereby becoming absorbed on said tar sands and reducing the viscosity of the bitumen remaining thereon;

(ii) essentially separating the mixture of step (i) into a liquid portion constituting crude oil or oils and dissolved bitumen and a solid portion constituting tar sands containing thereon bitumen and dissolved crude oil or oils;

(iii) forming a fixed bed of the solid portion of step (ii); and

(iv) passing an aqueous surfactant composition through said fixed bed of step (iii), whereby said surfactant composition psses through said fixed bed in a manner such that the substantial absence of agitation of tar sand particles is maintained and bitumen on said tar sands is displaced therefrom and is passed along with said surfactant composition through and out of said bed.

4,457,828
MESOPHASE PITCH HAVING ELLIPSPIDAL MOLECULES AND METHOD FOR MAKING THE PITCH

Irwin C. Lewis, Strongville, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 30, 1982, Ser. No. 363,557
Int. Cl.³ C10C 3/00; C09K 3/34; C07C 2/12
U.S. Cl. 585—11 12 Claims

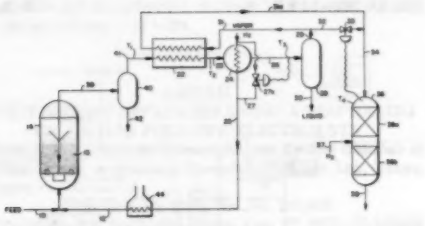
1. A mesophase pitch produced by the polymerization of an aromatic hydrocarbon containing at least two condensed rings in which the coupling polymerization constitutes at least 60% of the polymerization reactions, said polymerization being carried out with a weak Lewis acid and a polar solvent for said aromatic hydrocarbon, said solvent being non-reactive with said Lewis acid.

4,457,829

TEMPERATURE CONTROL METHOD FOR SERIES-CONNECTED REACTORS

Lawrence M. Abrams, Miami, Fla., assignor to HRI, Inc., Gibbsboro, N.J.

Filed Sep. 9, 1982, Ser. No. 416,184
Int. Cl.³ C10G *65/10, 65/12*
U.S. Cl. 208—49 **20 Claims**



1. A method for controlling the reactor temperature and hydrocarbon feed composition for a second reactor series-connected to a first reactor, comprising:

(a) cooling a first reactor effluent stream at 700°–850° F. temperature and containing vapor and liquid fractions from a first temperature to a first lower temperature by a first heat exchange step against a vapor stream obtained from a downstream phase separation step;

(b) cooling further said cooled effluent stream at said first lower temperature against an externally supplied cooling fluid in a second heat exchange step to a second lower temperature;

(c) separating vapor and liquid fractions from said further cooled effluent stream;

(d) reheating at least a portion of said separated vapor fraction by heat exchange with said first reactor effluent stream in said cooling step (a) to provide a temperature of 650°–830° F. which is intermediate of said first temperature and second lower temperatures; and

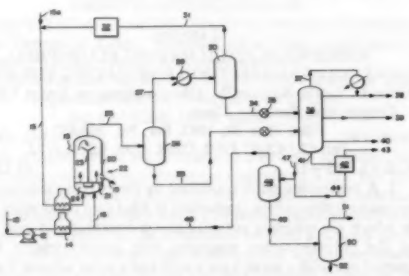
(e) feeding said reheated hydrocarbon vapor fraction at said intermediate temperature of 650°–830° F. to a second reactor.

4,457,830

PETROLEUM HYDROCONVERSION USING ACID PRECIPITATION OF PREASPHALTENES IN RESID RECYCLE

Paul H. Kydd, Lawrenceville, N.J., assignor to HRI, Inc., Gibbsboro, N.J.

Filed Dec. 28, 1981, Ser. No. 334,857
Int. Cl.³ C10G *47/08, 69/06*
U.S. Cl. 208—50 **9 Claims**



1. A process for hydroconversion of heavy hydrocarbon feedstocks containing preasphaltenes to produce lower-boiling hydrocarbon liquid products, comprising:

(a) introducing the feedstock with hydrogen into a catalytic reaction zone at reaction conditions within the ranges of 700°–900° F. temperature, and 1000–5000 psig hydrogen partial pressure for providing hydroconversion reactions therein;

(b) withdrawing reacted hydrocarbon liquid effluent material containing preasphaltenes and passing the material to phase separation and distillations steps to provide light product fractions and a bottoms fraction material stream normally boiling above about 950° F. and containing preasphaltenes;

(c) adding acid to said bottoms fraction material in a precipitation step to cause precipitation of the preasphaltene material;

(d) withdrawing an overhead liquid stream from said precipitation step and recycling the stream to the reaction zone for further hydroconversion therein;

(e) withdrawing a bottoms liquid fraction containing precipitated asphaltenes from the precipitation step for further processing to recover additional hydrocarbon liquid products; and

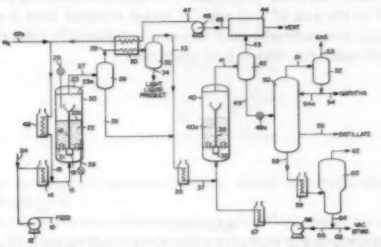
(f) withdrawing from the distillation step the hydrocarbon liquid products.

4,457,831

TWO-STAGE CATALYTIC HYDROCONVERSION OF HYDROCARBON FEEDSTOCKS USING RESID RECYCLE

Jeffrey L. Gendler, Richboro, Pa., assignor to HRI, Inc., Gibbsboro, N.J.

Filed Aug. 18, 1982, Ser. No. 409,203
Int. Cl.³ C10G *47/26*
U.S. Cl. 208—59 **11 Claims**



1. A process for catalytic hydroconversion of hydrocarbon feedstocks to lower boiling hydrocarbon liquids and gas, comprising:

(a) feeding a hydrocarbon feedstock containing fine particulate solids with hydrogen into a reactor containing an ebullated bed of particulate catalyst, said reactor being maintained at 780°–850° F. temperature, 800–3000 psig hydrogen partial pressure, and 0.3–2.5 V_f/hr/V_f space velocity for hydroconverting said feedstock to a mixture of hydrocarbon gas and lower boiling hydrocarbon liquid fractions;

(b) phase separating said gas from said liquid fractions and withdrawing from said liquid fractions a light hydrocarbon liquid product having a normal boiling range of 180°–400° F.;

(c) combining said gas with the remaining liquid fractions from said separation and passing the combined material to a second stage reactor containing an ebullated bed of particulate catalyst and further hydroconverting the material to hydrocarbon gas and other lower boiling liquid fractions;

(d) separating said hydrocarbon gas from said other liquid fractions and withdrawing said other liquid fractions;

(e) distilling said other liquid fractions to produce a medium boiling hydrocarbon liquid product having normal boiling range of 400°-975° F. and also a 975° F.+ vacuum bottoms material; and

(f) recycling a portion of said vacuum bottoms material to said second stage ebullated bed reactor to produce increased yields of said medium boiling hydrocarbon liquid product.

4,457,832

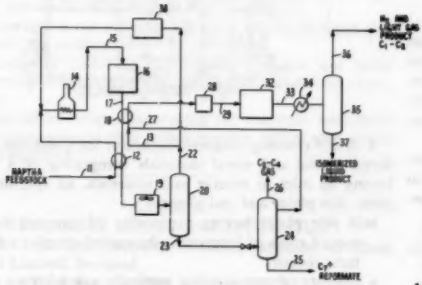
COMBINATION CATALYTIC REFORMING-ISOMERIZATION PROCESS FOR UPGRADING NAPHTHA

Richard C. Robinson, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 459,147, Jan. 19, 1983, abandoned. This application Dec. 6, 1983, Ser. No. 558,574

Int. Cl.³ C10G *35/04*

U.S. Cl. 208—66 **8 Claims**



1. A combination process for upgrading a naphtha feedstock comprising:

(a) catalytically reforming the naphtha feedstock;

(b) separating the reformate into one or more gas fractions which combined comprise hydrogen and C_1–C_4 hydrocarbons, a C_5–C_6 paraffin-rich liquid fraction, and a liquid residual fraction;

(c) catalytically isomerizing the C_5–C_6 paraffin-rich liquid fraction; and

(d) separating the isomerized C_5–C_6 paraffin-rich liquid fraction into a light gas product fraction and an isomerization liquid product fraction comprising C_5–C_6 hydrocarbons.

4,457,833

PROCESS AND CATALYST FOR THE CONVERSION OF CARBO-METALLIC CONTAINING OILS

Oliver J. Zandona, Ashland; William P. Hettinger, Jr., Russell; Stephen M. Kovach, Ashland, and Hubert W. Beck, Russell, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 296,679, Aug. 27, 1981. This application Sep. 29, 1982, Ser. No. 427,356

Int. Cl.³ C10G *11/05*

U.S. Cl. 208—120 **15 Claims**

1. In the process for catalytically cracking a reduced crude feed comprising metal contaminants and Conradson carbon producing components, the improvement which comprises effecting the catalytic cracking of a reduced crude boiling above 650° F. at a temperature within the range of 950° and 1100° F. in the presence of a diluent material such as dry gas, naphthas, steam and water sufficient to substantially reduce the partial pressure of the oil feed below atmospheric pressure, and employing as a special catalyst in said reduced crude cracking operation a composition of matter comprising, at least about 40 wt% of calcined rare earth exchanged "Y" crystalline zeolite of a lanthanum to cerium ratio of greater than 1/1, said catalyst providing a pore volume greater than 0.35 cc/gm comprising a matrix material providing at least about 40% of pore size in the range of 500 to 2000 angstroms, said catalyst composition comprising less than 0.30% sodium, a zeolite silica to alumina ratio of at least 5 and said catalyst prepared under conditions to provide an acidic matrix comprising said crystalline zeolite.

4,457,834

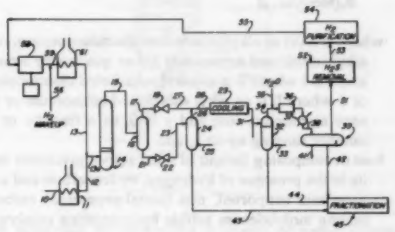
RECOVERY OF HYDROGEN

John Caspers, Basking Ridge, and Rinaldo Kramer, Montclair, both of N.J., assignors to Lummus Crest, Inc., Bloomfield, N.J.

Filed Oct. 24, 1983, Ser. No. 544,716

Int. Cl.³ C10G *49/22*

U.S. Cl. 208—143 **28 Claims**



1. In a process for hydrogenating a hydrocarbon feed at a hydrogenation pressure of at least 1000 psig wherein a hydrogenation effluent comprising a liquid portion and a gaseous portion is recovered from the hydrogenation, said gaseous portion containing unreacted hydrogen and impurities, the improvement comprising:

(a) reducing the pressure of said gaseous portion from a hydrogenation pressure of at least 1000 psig to a lower pressure which is at least 200 psi less than the hydrogenation pressure and which is not in excess of 1500 psig to provide a gas containing hydrogen and impurities at a reduced pressure;

(b) removing impurities from gas from step (a) to provide a hydrogen gas containing at least 70%, by volume, of hydrogen; and

(c) increasing the pressure of hydrogen gas from step (b) to an elevated pressure which is at least 1000 psig and which is at least 200 psi greater than the lower pressure for use in a hydrogenation process.

4,457,835

DEMETALLIZATION OF HYDROCARBON CONTAINING FEED STREAMS

Simon G. Kukes, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 30, 1983, Ser. No. 538,068

Int. Cl.³ C10G *45/00, 45/04, 45/06*

U.S. Cl. 208—251 H **15 Claims**

1. A process for the demetallization of a hydrocarbon containing feed stream, which contains metals, comprising the step of contacting said hydrocarbon containing feed stream under suitable demetallization conditions with hydrogen and a catalyst composition comprising zirconium phosphate and copper phosphate.

4,457,836
SUPPORTED, NON (METAL-PROMOTED) CARBON-CONTAINING MOLYBDENUM SULFIDE CATALYSTS FOR SELECTIVE NITROGEN REMOVAL

Robert L. Seiver, Baton Rouge, La.; Charles Rebick, Annandale, N.J., and Duane A. Goetsch, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed May 13, 1983, Ser. No. 494,539
Int. Cl.³ C10G 45/04
U.S. Cl. 208—254 H 9 Claims

1. A process for the hydrotreating and selective removal of nitrogen from petroleum distillate feedstocks without significant desulfurization which comprises contacting said feed at hydrotreating conditions with a supported, non (metal-promoted) carbon-containing molybdenum sulfide hydrotreating catalyst formed by the steps comprising

compositing a preselected quantity of a porous, refractory inorganic oxide with a salt characterized by the formula

$$B_x[MoO_yS_{4-y}]$$

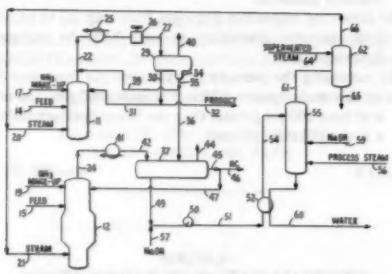
where B is (a) an alkyl substituted diammonium ion, or (2) an alkyl substituted ammonium ion or quaternary ammonium ion; x is 1 where B is an alkyl substituted diammonium ion, or 2 where B is an alkyl substituted ammonium or quaternary ammonium ion; and y is 0, or a fraction or whole number ranging up to 3, and

heat decomposing the salt of said catalyst precursor composite in the presence of hydrogen, hydrocarbon and sulfur to form said supported, non (metal-promoted) carbon-containing molybdenum sulfide hydrotreating catalyst.

4,457,837
EFFICIENCY ADDITION OF AMMONIA TO PETROLEUM FRACTIONATION UNITS

Robert A. Farnham, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 23, 1982, Ser. No. 401,340
Int. Cl.³ C10G 7/10
U.S. Cl. 208—362 9 Claims

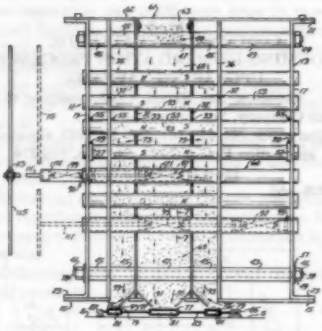


1. In a process for distilling petroleum in a distillation column in the presence of added ammonia and stripper steam wherein an aqueous ammonia-containing hydrocarbon overhead is formed, condensed and separated into an aqueous ammonia phase and a hydrocarbon phase, the improvement comprising recovering the aqueous ammonia phase, steam stripping ammonia from said aqueous ammonia phase in a stripper column, thereby yielding an ammoniacal steam stripper overhead and a substantially ammonia-free stripper bottoms and returning said ammoniacal steam to said distillation column as stripper steam.

4,457,838
SELF-CLEANING MAGNETIC SEPARATOR FOR POWDERED PLASTIC AND METAL MATERIALS AND METHOD

Ronald Carr, 23743 Research Dr., Farmington, Mich. 48024

Filed May 26, 1982, Ser. No. 382,137
Int. Cl.³ B03C 1/26
U.S. Cl. 209—223.2 23 Claims



1. A self cleaning magnetic separator for a mixture of powdered plastic and metal materials comprising of a housing having an inlet to receive said materials, an apertured base plate, side plates and end plates;

said side plates having a plurality of opposed vertically spaced rows of longitudinally spaced circular tube apertures therein;

a plurality of correspnding vertically spaced rows of laterally spaced pilot tubes snugly extending through said apertures, spanning said side plates and secured thereto;

the tubes in one row being laterally displaced with respect to the tubes of an adjacent row of tubes to define a circuitous falling path within said housing for said materials;

an upright tube clearance plate within said housing intermediate said side plates having a corresponding series of apertures oversized with respect to said tubes defining a corresponding series of clearance apertures surrounding said tubes;

said clearance plate defining on one side thereof an upright plastic feed chamber communicating with said inlet and having a throated outlet extending through said base plate;

an upright wiper plate within said housing intermediate said clearance plate and one side plate having a corresponding series of apertures snugly receiving said tubes respectively, defining with said clearance plate an upright metal feed chamber for metal materials separated from said plastic materials and having a throated outlet extending through said base plate;

an elongated magnet assembly slidably mounted upon and intermittently reciprocal within each tube;

each magnetic assembly being of a length substantially corresponding to the length of said tubes within said plastic feed chamber;

and normally positioned within said plastic feed chamber;

and a pusher plate upon the exterior of said housing connected to said magnetic assemblies for effecting intermittent reciprocal movement thereof;

falling particles of plastic material cascading down and over said tubes within said plastic feed chamber for delivery through its outlet;

falling particles of metal within said plastic feed chamber adhering to said tubes;

retraction of said pusher plate and connected magnetic assemblies through and outwardly of said metal feed chamber sliding the accumulated metal material along the re-

spective pilot tubes through said clearance plate and into and through said metal feed chamber;
said wiper plate stripping said metal materials from said tubes, said metal material falling by gravity within said metal feed chamber and through its outlet.

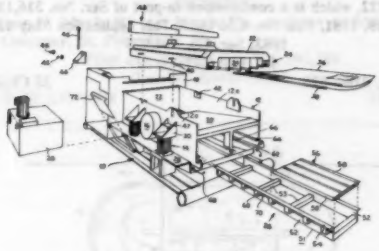
23. The method of separating a mixture of powdered plastic and metal materials which comprises the steps of:
introducing said mixture into the top of a plastic feed chamber containing therein a plurality of vertically spaced staggered rows of laterally spaced pilot tubes each containing a magnetic assembly;
cascading the mixture by gravity through a circuituous path over said tubes;
magnetically adhering the metal particles of said mixture to surface portions of said tubes during the downward flow of plastic material;
simultaneously retracting the magnetic assemblies in all of the tubes and magnetically sliding the accumulated metal particles adhering to said tubes out from the plastic feed chamber into a metal feed chamber;
and mechanically stripping the metal materials from the pilot tubes on retraction of the magnetic assemblies through and outwardly of said metal feed chamber;
the separated metal particles falling by gravity through said metal feed chamber;
independently collecting the separated plastic and metal materials falling from said plastic and metal feed chambers;
and the further step of advancing the magnetic assemblies simultaneously to their initial position within said plastic feed chamber.

4,457,839

VIBRATORY SCREENING APPARATUS

Marshall G. Bailey, Banchory, Scotland, assignor to Thule United Limited, Scotland

Filed Sep. 25, 1981, Ser. No. 305,717
Claims priority, application United Kingdom, Oct. 20, 1980, 8033714
Int. Cl.³ B07B 9/00
U.S. Cl. 209—234 **19 Claims**



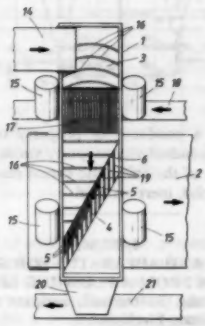
11. Vibratory screening apparatus comprising:
(a) a cradle mounted for vibratory motion, said cradle including two pairs of fixed upper and lower spaced support means,
(b) a screen having two opposing sides respectively adapted to be normally positioned between said upper and lower spaced support means, and
(c) a bottom screen frame insertable into or withdrawable from said cradle and having two opposite side portions adapted to be positioned in operation below and supporting said opposing sides of said screen, said frame when inserted into said cradle being adapted in operation to rest on said lower support means, said screen frame having means connected to said two side portions for urging said side portions upward when said screen and frame are in operating position in said cradle, thereby to clamp said two opposing sides of said screen between said upper support means and the opposite side portions of said screen frame, said urging means also being constructed to let said side portions be lowered to permit sliding removal of said screen or said frame from said cradle.

4,457,840

APPARATUS FOR DELIVERING A STREAM OF GREEN PELLETS

Martin Nagl, Rutzenmoos, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed May 27, 1982, Ser. No. 382,582
Claims priority, application Austria, Jul. 27, 1981, 3294/81
Int. Cl.³ B07B 1/40, 11/06; B65G 47/20
U.S. Cl. 209—257 **6 Claims**



1. An apparatus for delivering a stream of green pellets, which comprises
(a) a wide belt conveyor having a conveyance surface and
(b) a vibrating conveyor having a deck for supporting green pellets and positioned and arranged with respect to the wide belt conveyor so as to convey green pellets to the wide belt conveyor in a direction of conveyance over a discharge edge, the discharge edge having an adjustable configuration and extending at an acute angle to the conveyance direction across the conveyance surface of the wide belt conveyor whereby green pellets discharged over the edge form a layer on the conveyance surface,
(c) a plurality of parallel deck bars axially slidably connected to the vibrating conveyor deck and having end portions protruding therefrom in the conveyance direction, the protruding deck bar ends defining the discharge edge, and
(d) means for axially sliding the deck bars for adjusting the discharge edge configuration.

4,457,841

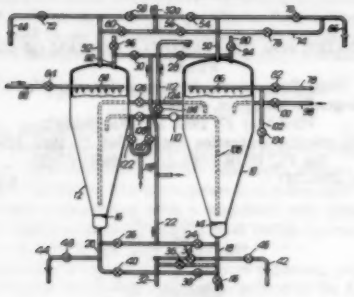
REGENERATION OF ION EXCHANGE MATERIALS

James R. Emmett, Brewood, England, assignor to Northern Engineering Industries plc, England

Continuation of Ser. No. 135,920, Mar. 31, 1980, Pat. No. 4,298,696, which is a continuation-in-part of Ser. No. 907,029, May 17, 1978, abandoned. This application Aug. 6, 1981, Ser. No. 290,585
Claims priority, application United Kingdom, May 27, 1977, 22417/77
Int. Cl.³ B03B 5/66
U.S. Cl. 209—454 **8 Claims**

1. A method for separating a resin bed of a mixture of anion and cation exchange resins comprising the steps of:
(a) classifying the mixture of the cation and anion resins using a classifying fluid in the presence of a solid, inert material which (1) imparts measurably different conductivity properties to the classifying fluid than the cation and anion exchange resin and (2) has fluidization characteristics such that, upon classification, it forms an intermediate

layer positioned between the layer of anion resin and layer of cation resin and



(b) measuring a conductivity property of the resin bed wherein the conductivity property varies with the degree of separation of the anion and cation resins and the position of the solid, inert material.

4,457,842

METHOD OF AND APPARATUS FOR SEPARATING SOLIDS FROM A FLUSHING LIQUID

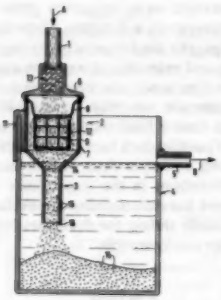
Rolf Bereiter, Grabs, Switzerland, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Jul. 14, 1982, Ser. No. 398,189

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1981, 3128612

Int. Cl.³ C02F *1/56*

U.S. Cl. 210—198.1 **7 Claims**



1. Apparatus for separating solids from a liquid such as used in flushing out boreholes and the like drilled or cut in rock, concrete, masonry and similar materials, comprising a settling tank having a liquid level therein, a feed line for flowing the flushing liquid into the settling tank, a receiving device containing flocculant and located downstream of said feed line so that the flushing liquid from said feed line entrains the flocculant before entering the settling tank, said feed line having an outlet end, said receiving device supported at the outlet end of said feed line and arranged to convey the flushing liquid downwardly from the feed line into said settling tank, a holding basket is located within and spaced inwardly from the inner surface of said receiving device, a solid flocculant block is located within said holding basket, and a mixer is secured to and extends downwardly from said receiving device with said mixer located below said holding basket, the lower end of said mixer extends downwardly into said settling tank below the liquid level therein.

4,457,843

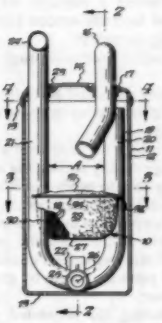
SELF-RETAINING ADSORBENT CONTAINER

John S. Cullen, Buffalo; Samuel A. Incorvia, and James A. Vogt, both of Tonawanda, all of N.Y., assignors to Multiform Desiccants, Inc., Buffalo, N.Y.

Filed May 12, 1982, Ser. No. 377,385

Int. Cl.³ B01D *15/00, 53/04*

U.S. Cl. 210—282 **14 Claims**



1. In a refrigerant receiver having spaced substantially parallel refrigerant pipes, an adsorbent container comprising a porous casing having a porous outer wall and a porous end wall, adsorbent in said porous casing, a plurality of substantially concave indentations in said porous outer wall, said concave indentations being spaced from each other a distance to receive said substantially parallel refrigerant pipes therein so as to permit said casing to be slid axially of said refrigerant pipes.

4,457,844

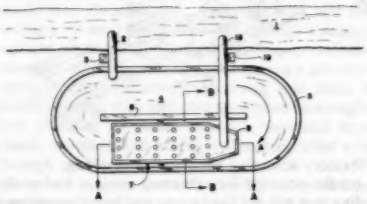
CONTINUOUS WASTE WATER CLARIFICATION PROCESS

Harold J. Beard, P.O. Box 3838, Baton Rouge, La. 70821

Continuation-in-part of Ser. No. 370,802, Apr. 22, 1982, Pat. No. 4,383,922, which is a continuation-in-part of Ser. No. 316,112, Oct. 29, 1981, Pat. No. 4,362,625. This application May 12, 1983, Ser. No. 494,005

Int. Cl.³ C02F *3/22*

U.S. Cl. 210—624 **23 Claims**



1. A process for clarifying a waste water stream comprising:
(a) circuitously flowing said waste water stream in an oxidation ditch having an elongated clarifier positioned therein with its front section heading into the flow of said waste water stream and positioned to decrease the cross-sectional area of said waste water stream in said oxidation ditch where said clarifier is located,
(b) diverting a portion of said waste water stream into said clarifier in a countercurrent direction of the flow of said waste water stream in said oxidation ditch,
(c) causing said portion to flow at a rate and distance sufficient to separate said portion into a clarified phase and a sludge phase,

(d) removing said sludge phase wherein the volume amount of said sludge phase removed from said clarifier through said portion is controlled by varying the head differential between the level of said portion inside and the level of said waste water stream outside of said clarifier, and
(e) removing said clarified phase from said clarifier.

4,457,845
RECOVERY OF PHOSPHORUS FROM SLUDGE

James A. Robertson, Levittown, Pa., assignor to FMC Corporation, Philadelphia, Pa.

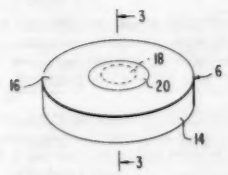
Filed Aug. 11, 1982, Ser. No. 407,012
Int. Cl.³ B01C *13/00*
U.S. Cl. 210—651 27 Claims

12. A process for separating phosphorus from a electrothermal phosphorus plant sludge containing phosphorus, water and an impurity insoluble therein comprising:
(a) contacting sludge with the proximal surface of a hydrophobic barrier, said barrier having openings connecting the proximal and distal surfaces thereof;
(b) applying sufficient force on the sludge whereby the phosphorus in the sludge wets the proximal surface of the barrier, passes through the openings and collects on the distal side of said barrier as a coalesced mass substantially free of impurities, and
(c) recovering the phosphorus from the distal surface of the barrier.

4,457,846
LIQUID CHROMATOGRAPHY METHODS AND DEVICES

Miner N. Munk, Riviera Beach, Fla., assignor to Milton Roy Company, St. Petersburg, Fla.

Filed Jul. 8, 1982, Ser. No. 396,389
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—656 22 Claims

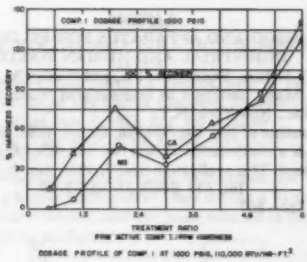


1. In the analysis of substances by liquid chromatography, the improved method of introducing a sample of substance to be analyzed into a chromatographic column which comprises:
providing a cartridge comprising an impervious plate having a fluid permeable section of substantially the same cross-sectional area as said chromatographic column used in the analysis,
loading said sample of said substance into said permeable section of said cartridge,
placing said cartridge at the inlet end of said column with said permeable section covering said inlet end and
flowing solvent into said column through said permeable section.

4,457,847
CARBOXYLATE POLYMERS FOR INTERNAL SCALE CONTROL AGENTS IN BOILER SYSTEMS

Walter F. Lorenc, Harvey; John A. Kelly, , Woodridge, both of Ill., and Frederick S. Mandel, Baton Rouge, La., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 318,665, Nov. 5, 1981, abandoned. This application May 28, 1982, Ser. No. 382,567
Int. Cl.³ C02F *5/10*
U.S. Cl. 210—698 14 Claims


COMP. I DOSAGE PROFILE (000 PSI)
90% % HARDNESS RECOVERY
CA
MG
TREATMENT RATIO
DOSAGE PROFILE OF COMP. I AT 1000 PSIG, 110,000 BTU/HR-FT²

1. A method of treating hardness present in boiler waters which are in contact with heat transfer surfaces to prevent formation of scale on, and to remove previously formed scale from, these heat transfer surfaces which comprises treating the boiler waters with a water-soluble sequestrant anionic vinyl polymer containing at least 30% by weight of carboxylate functionality, said polymer having a molecular weight within the range of 500–50,000 and a chelation value of at least 200 which chelation value represents the milligrams of calcium or magnesium expressed in terms of calcium carbonate complexed by one gram of a sequestrant, and with the amount of said sequestrant anionic vinyl polymer being within the range of 1–30 ppm per ppm hardness present in such boiler waters, whereby the hardness in the boiler waters is sequestered by the water-soluble sequestrant anionic vinly polymer thereby preventing formation of scale on, and removing previously formed scale from, the heat transfer surfaces of boilers.

4,457,848
PROCESS FOR AFTER-TREATING EXTRACTION RESIDUES ORIGINATING FROM THE DECONTAMINATION OF PHOSPHORIC ACID

Günther Schimmel, Erftstadt; Reinhard Gradl, Hürth, and Gero Heymer, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 27, 1982, Ser. No. 412,142
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135801
Int. Cl.³ C02F *1/52*; C01B *25/26*
U.S. Cl. 210—724 5 Claims

1. Process for after-treating sulfuric acid extraction residues, termed raffinates, originating from the extractive decontamination of crude phosphoric acid with the aid of organic solvents in the presence of sulfuric acid, by reacting these raffinates with calcium compounds producing an alkaline reaction which comprises: converting the raffinates into two separate solid matter fractions of different chemical composition by effecting the following operational steps:
(a) admixing the water-containing raffinates with the calcium compound so as to establish a pH-value of 1.2 up to 2.5;
(b) filtering off, as a first solid matter fraction, the resulting precipitate consisting essentially of gypsum, and washing it with water;
(c) making the resulting filtrate and wash water into a mixture, admixing the latter with predetermined proportions of calcium compound so as to obtain, after complete reac-

tion, a fully reacted filter cake with a pH-value of 9 up to 12, determined on a 10 weight % aqueous suspension, and filtering the resulting suspension upon establishment of a pH-value of 6 to 8; and

(d) separating, as the second solid matter fraction, the filter cake consisting essentially of calcium phosphate, and allowing it to react completely.

4,457,849

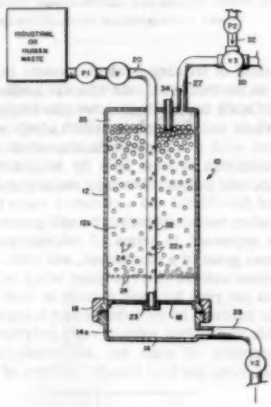
METHOD AND APPARATUS FOR FILTERING INDUSTRIAL AND HUMAN WASTE

Walter O. Heinze, Swathmore, Pa., and Wesley M. Tufts, Holliston, Mass., assignors to International Water Saving Systems, Inc., New York, N.Y.

Continuation of Ser. No. 308,586, Oct. 5, 1981, abandoned, which is a continuation of Ser. No. 146,920, May 5, 1981, abandoned. This application Sep. 7, 1983, Ser. No. 530,027

Int. Cl.³ B01D *23/10, 33/18*

U.S. Cl. 210—807 **2 Claims**



2. The method of filtering a fluid containing extraneous solids comprising: confining a bed of buoyant, loosely-associated, discrete filter bodies within a tank between vertically-spaced upper and lower perforate barriers in such volume as to incompletely fill the space between said barriers and to provide a repository below said lower barrier, said upper barrier comprising a fine filter, and said lower barrier comprising a perforated plate having perforations too small to permit passage of the filter bodies, but large enough to permit extraneous solids to gravitate from said space to said repository, introducing said fluid through a vertically disposed conductor, centrally situated in said tank, into the midst of the bed in a region below the upper barrier at a pressure of 10 to 100 psi to cause dense packing of the filter bodies in the bed above the region of entry of the fluid into the bed against the upper one of the perforate barriers and dispersion of the filter bodies of the bed below the region of entry of the fluid into the bed accompanied by weltering of said dispersed filter bodies such as to rub the solids accumulated thereon from the filter bodies to cause gravitation of the solids downwardly through the dispersed filter bodies and through the lower one of the perforate barriers into said repository, collecting the downwardly-gravitating solids in said repository, withdrawing the collected solids from said repository, and drawing off the filtered fluid from the tank upwardly through the densely-packed region of the filter bodies above the place of entry of the fluid into the bed and through the upper one of the perforate barriers.

4,457,850

FLOTATION AIDS AND PROCESS FOR NON-SULFIDIC MINERALS

Holger Tesmann, Düsseldorf, and Helmut Kachel, Bremerhaven, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Filed May 6, 1983, Ser. No. 492,280

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1982, 3238060

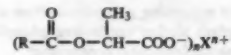
Int. Cl.³ B03D *1/00, 1/08;* **C22B** *1/00, 3/00*

U.S. Cl. 252—61 **20 Claims**

1. A method of separating non-sulfidic minerals from an ore in which they are contained by flotation comprising the steps of:

(a) mixing said ore in ground form with water to form an aqueous suspension thereof;

(b) adding to the aqueous suspension an effective quantity of at least one collector having the formula:



I

wherein R represents an aliphatic, cyclic, or alicyclic C_7–C_{23} radical, optionally substituted with one or more hydroxyl sulfhydryl, carbonyl, ether, or thioether groups, X^{n+} is hydrogen or a water-solubilizing, salt forming cation, and n is the valence of X;

(c) introducing air into the aqueous suspension to form a froth that floats on the surface of the suspension, wherein the froth contains a concentrate of the non-sulfidic minerals; and

(d) separating off the froth containing said concentrate from the aqueous suspension.

4,457,851

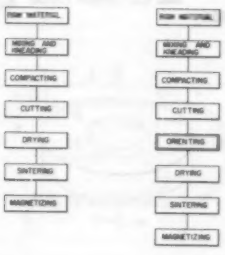
FERRITE MAGNET AND METHOD OF PRODUCING SAME

Kazunori Tabaru, Saitama, and Noriyuki Noda, Kumagaya, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,546

Int. Cl.³ B06B *1/02*

U.S. Cl. 252—62.63 **15 Claims**



1. A ferrite magnet of the cylindrical shape having a plurality of magnetic poles on its surface produced by subjecting at least to drying, sintering and magnetizing a mixture comprising magnetoplumbite type ferrite particles as its principal component after such mixture has been subjected to extrusion compacting,

wherein said ferrite particles are oriented in anisotropic direction by applying at least one pulse magnetic field on the surface of the compact after the extrusion compacting but before the magnetizing, and the ferrite magnet has a surface magnetic flux density Bo of over 1400 G when it is ground by less than 3 mm in diameter following sintering.

4,457,852

ANTI-GEL CHARACTERISTICS OF SILICATE-CONTAINING ANTIFREEZE COMPOSITIONS

Sidney F. Bosen, Joliet, Ill., assignor to Northern Petrochemical Company, Omaha, Nebr.

Filed Jul. 14, 1983, Ser. No. 513,765
Int. Cl.³ C09K 5/00
U.S. Cl. 252—78.3 8 Claims

1. An improved corrosion-inhibited alcohol antifreeze composition for use in the cooling systems of internal combustion engines which comprises:

(a) An alcohol selected from the group consisting of methanol, ethanol, propanol, ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol, and glycerol,

(b) A silicate corrosion inhibitor, and

(c) At least about 0.002% and less than about 0.05% by weight of a mercaptosilane of the formula:

$$(SH—R_1)_n—Si(R_2)_{4-n}$$

wherein n is 1, 2, or 3, R_1 is branched or straight chain alkyl with 1 to 8 carbon atoms or aromatic with 6 to 10 carbon atoms, and R_2 is a reactive group which will cause the mercaptosilane to form a silanol when hydrolyzed.

4,457,853

OIL WELL DRILLING CLAY CONDITIONERS AND METHOD OF THEIR PREPARATION

William J. Detroit, Schofield, Wis., assignor to Reed Lignin Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 277,714, Jun. 26, 1981. This application Apr. 27, 1982, Ser. No. 372,141
Int. Cl.³ C09K 7/02
U.S. Cl. 252—8.5 A 22 Claims

1. An oil well drilling fluid additive comprising the reaction product of sulfonated lignin-containing material with manganese dioxide and a boron compound having from about 1 to about 5 percent by weight boron and from about 8 to about 20 percent by weight manganese.

4,457,854

HIGH BULK DENSITY CARBONATE-ZEOLITE BUILT HEAVY DUTY NONIONIC LAUNDRY DETERGENT

William J. Gangwisch, New Brunswick; Virgil J. Richter, West Orange; Harold E. Wixon, New Brunswick, and Joseph B. Wraga, Bogota, all of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 384,994, Jun. 4, 1982, Pat. No. 4,406,808, which is a continuation of Ser. No. 839,781, Oct. 6, 1977, abandoned. This application Sep. 30, 1982, Ser. No. 430,976
Int. Cl.³ C11D 3/08, 3/10, 3/12, 11/02
U.S. Cl. 252—91 7 Claims

1. A free flowing, phosphate-free, particulate, heavy duty laundry detergent product having a bulk density of greater than about 0.6 g per ml comprising porous, spray-dried base beads of about 45% crystalline zeolite particles having ultimate particle sizes of 15 microns or less, about 13% sodium carbonate, about 8% anhydrous sodium silicate having an $Na_2O:SiO_2$ ratio of about 1:2.4, said sodium silicate being combined in a hydrous form, and said beads having about 20% nonionic surfactant absorbed into the interior of said beads, said percentages being by weight relative to the total weight of the composition;

said nonionic surfactant containing beads being produced by:

(a) preparing a crutcher mix by adding about 55 parts hydrated crystalline zeolite particles (45 parts anhydrous basis) in the form of an aqueous slurry to an aqueous slurry of 13 parts sodium carbonate and 10 parts water-soluble sodium silicate having an $Na_2O:SiO_2$ ratio of 1:2.4 to form a gel, said zeolite having an average ultimate particle diameter of about 15 microns or less, the total water content of the mix being 50 parts and the sodium silicate being added as a 40% solids aqueous solution;

(b) shearing the gel to reduce the viscosity thereof,

(c) spray-drying the crutcher mix to form said spray-dried beads having a water content of about 14% and

(d) mixing with about 80 parts of said beads about 20 parts of said surfactant in liquid form so that the surfactant is absorbed into the beads to produce said nonionic detergent containing spray-dried beads.

4,457,855

STABLE HYPOCHLORITE SOLUTION SUSPENDABLE DYES

Barry A. Sudbury, and Alfred G. Zielske, both of Pleasanton, Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Jun. 8, 1981, Ser. No. 271,159
Int. Cl.³ C01B 11/06; C11D 7/54, 7/56
U.S. Cl. 252—98 9 Claims

1. A hypochlorite solution stable suspendable dye particle, comprising a highly hydrophobic latex having a hydrophobic dye incorporated therein, said dye being selected to be resistant to hypochlorous acid attack.

4,457,856

LIQUID DETERGENT COMPOSITION CONTAINS ABRASIVE PARTICLES, ANIONIC AND NONIONIC SURFACTANTS

Sharon J. Mitchell, West Chester, and Jonathon Spinner, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 291,867, Aug. 10, 1981, abandoned, which is a continuation of Ser. No. 110,148, Jan. 7, 1980, abandoned. This application Apr. 21, 1983, Ser. No. 485,755
Int. Cl.³ C11D 3/06, 3/08
U.S. Cl. 252—166 14 Claims

1. A liquid dishwashing detergent composition comprising by weight:

(a) from about 20% to about 35% of an anionic surfactant;

(b) from about 2% to about 8% of a suds stabilizing nonionic surfactant selected from the group consisting of amine oxides and amides;

(c) from about 1% to about 20% of a water-insoluble abrasive having a particle diameter of from about 5 to 250 microns and a hardness on the Mohs scale of from about 2 to about 8; and

(d) from about 40% to about 75% water;

said composition providing an initial suds cover to a dishwashing solution and a suds cover after the washing of eight plates when used at a concentration of 0.07% in two gallons of 115° F. water containing 7 grains/gallon water hardness measured as $CaCO_3$, each plate carrying 4.0 ml. of triglyceride-containing soil.

4,457,857

PRETREATMENT COMPOSITION FOR STAIN REMOVAL

Ralph R. Sepulveda, Suffern, N.Y., and Lynn H. Lander, Harrington Pk., N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 198,336, Oct. 20, 1980, Pat. No. 4,363,756, which is a continuation of Ser. No. 049,774, Jun. 18, 1979, abandoned. This application Jul. 2, 1982, Ser. No. 394,607
The portion of the term of this patent subsequent to Dec. 14, 1999, has been disclaimed.
Int. Cl.³ C11D 1/72, 1/75, 1/83, 3/20
U.S. Cl. 252—174.21 2 Claims

1. An active composition for the pre-laundering treatment of stains on fabrics consisting essentially of:

(a) about 25% to about 90% of at least one di-ester formed of a fatty acid of about 8 to about 22 carbon atoms chain

length, and a polyethylene glycol or a polypropylene glycol;

(b) 0 to about 75% of at least one nonionic surface-active agent; and

(c) 0 to about 60% of at least one anionic surface-active agent;

the total of (b) and (c) being about 10% to about 75%.

4,457,858

METHOD OF MAKING COATED GRANULAR BLEACH ACTIVATORS BY SPRAY DRYING

Herbert Saran, deceased, late of Düsseldorf, Fed. Rep. of Germany, by Karin Saran, née Müller, executor, and Martin Witthaus, Düsseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 7, 1982, Ser. No. 396,149

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1981, 3128336

Int. Cl.³ C09K *3/00*

U.S. Cl. 252—182 **20 Claims**

1. A process for the preparation of a bleach activator in granular form comprising the steps of

(a) forming an aqueous slurry comprising

(A) a bleach activator in powder form, and

(B) at least one compound selected from the group consisting of water soluble cellulose ethers, starches, and starch ethers,

wherein the slurry contains from about 1 to about 1.7 parts by weight of water per 1 part by weight of the combined nonaqueous ingredients in the slurry, wherein the weight ratio of (A) to (B) is from about 99:1 to about 90:10; and

(b) spraying said slurry into a drying chamber wherein the drying gas has an initial contact temperature of from about 100° to about 200° C. to form a granulated bleach activator product having a water content of not more than about 3% by weight.

4,457,859

MESOMORPHIC MATERIAL CONTAINING 2,2'-AZOIMIDAZOLE COMPOUNDS CONTAINING 1,1'-BENZYLIDENEAMINO SUBSTITUENTS

Alexandr V. Ivaschenko, Pervomaiskaya, 44a, kv. 57; Valentina T. Lazareva, Oktyabrskaya, 22, korpus 3, kv. 19; Elena K. Prudnikova, Likhachevskoe shosse, 20, kv. 29; Vladimir G. Rumyantsev, Likhachevskoe shosse, 20, korpus 1, kv. 165; Tamara S. Pljusnina, Likhachevskoe shosse, 20, kv. 22, all of Dolgoprudny Moskovskoi oblasti; Viktor A. Nefedov, pereulok Obukha, 4, kv. 62, Moscow; Lev M. Blinov, ulitsa Dubninskaya, 2, Korpus 5, kv. 79, Moscow; Viktor V. Titov, ulitsa Festivalnaya, 12, kv. 95, Moscow; Vladimir P. Sevostyanov, ulitsa B. Khmelnitskogo, 20/24, kv. 25, Saratov, and Vadim M. Shoshin, ulitsa Polevaya, 7, kv. 69, Fryazino Moskovskoi oblasti, all of U.S.S.R.

PCT No. PCT/SU81/00059, § 371 Date Mar. 23, 1982, § 102(e) Date Mar. 23, 1982, PCT Pub. No. WO82/00472, PCT Pub. Date Feb. 18, 1982

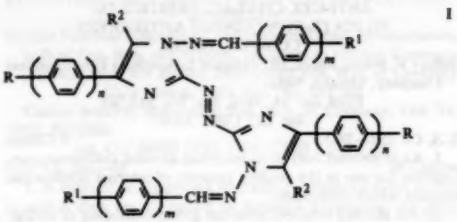
PCT Filed Jun. 25, 1981, Ser. No. 364,848

Claims priority, application U.S.S.R., Jul. 31, 1980, 2967265; Jul. 31, 1980, 2967803; Jul. 31, 1980, 2967844; Jul. 31, 1980, 2967311

Int. Cl.³ C07D *233/88;* C09K *3/34;* C08L *63/00*

U.S. Cl. 252—299.61 **10 Claims**

1. A mesomorphic material, comprising 0.4 to 3.5% by weight of at least one as cis- or trans-2,2'-azoimidazole or a mixture thereof of the formula:



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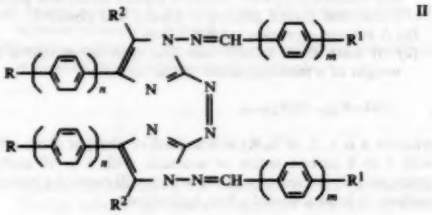


II

wherein R and R^1 are the same or different and each represents hydrogen, an alkyl or an alkoxy containing 1 to 12 carbon atoms or NO_2; R^2 is hydrogen or an alkyl containing 1 to 3 carbon atoms; n and m are the same or different and each represents an integer of from 1 to 3, and up to 100% by weight of a mesomorphic matrix.

4,457,860

USE OF HETEROCYCLIC AMMONIUM POLYAMIDOAMINES AS DEMULSIFIERS

Jerry R. Conklin, and Larry R. Wilson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 26, 1982, Ser. No. 371,640

Int. Cl.³ B01D *17/04*

U.S. Cl. 252—344 **9 Claims**

1. A demulsification method which comprises contacting an emulsion of oil and water with a demulsifying amount of a water-soluble ammonium polyamidoamine having amide and amine moieties in its backbone and heterocyclic ammonium moieties or an ammonium moiety capable of forming a heterocyclic moiety in its backbone and/or pendant therefrom.

4,457,861

METHOD, MATERIALS AND APPARATUS FOR MANUFACTURING PRINTED CIRCUITS

Raymond C. DesMarais, Jr., North Chelmsford, Mass., assignor to Additive Technology Corporation, North Chelmsford, Mass.

Division of Ser. No. 103,157, Dec. 13, 1979, Pat. No. 4,327,124. This application Apr. 26, 1982, Ser. No. 372,093

Int. Cl.³ H05K *3/12*

U.S. Cl. 252—512 **2 Claims**

1. An electrically conductive ink for use in printing an electrically conductive circuit on a dielectric surface, consisting essentially of:

(a) a thermosetting resin;

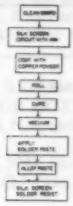
(b) conductive metal particles dispersed in said resin;

(c) a catalyst;

(d) said resin, said particles and said catalyst being present in said ink by weight percent respectively of approximately 23%, 71% and 6%;

(e) said resin being a phenolic resin;

(f) said particles being formed of copper having an average particle size of approximately 325 mesh;



(g) said catalyst being comprised of substantially equal parts by weight of anhydrous isoproponol and an inorganic acid; and

(h) said acid being phosphoric acid.

4,457,862

ODORANT SUBSTANCES

Josiane Baudin, Annemasse, France, and Hans U. Gonzenbach, Geneva, Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

PCT No. PCT/CH82/00029, § 371 Date Nov. 9, 1982, § 102(e) Date Nov. 9, 1982, PCT Pub. No. WO82/03216, PCT Pub. Date Sep. 30, 1982

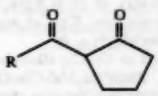
PCT Filed Feb. 25, 1982, Ser. No. 441,597

Claims priority, application Switzerland, Mar. 13, 1981, 1718/81; Feb. 11, 1982, 841/82

Int. Cl.³ C07C *49/537;* A61K *7/46*

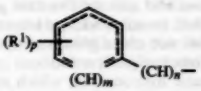
U.S. Cl. 252—522 R **11 Claims**

1. A compound of the formula



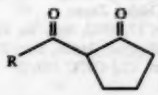
(I)

wherein R signifies an aliphatic group of the formula



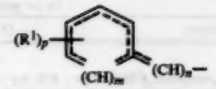
in which R^1 is C_{1-4}alkyl, C_{1-4}-alkylidene or C_{2-4}-alkenyl and the sum of the carbon atoms in these groups is 2–5, m and n are 0 or 1, p is 1, 2 or 3 and the dotted lines represent one or two optional double bonds, with the exception of 2-[3,3,5-trimethylcyclohexylacetyl]-cyclopentanone.

8. Odorant compositions containing an olfactorily effective amount of a compound of the formula



(I)

wherein R signifies an aliphatic group of the formula



in which R^1 is C_{1-4}-alkyl, C_{1-4}-alkylidene or C_{2-4}-alkenyl and the sum of the carbon atoms in these groups is 2–5, m and n are 0 or 1, p is 1, 2 or 3 and the dotted lines represent one or two optional double bonds and at least one other odorant.

4,457,863

ANTITUMOR SUBSTANCE

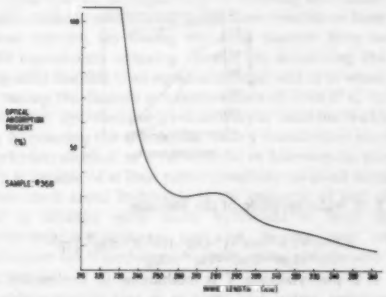
Kimitoshi Kawai; Kunio Sugawara, and Tsuyoshi Morinaga, all of Ohimachi, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka; Sapporo Breweries Ltd., Tokyo and Etsuo Ito, Okinawa, all of, Japan

Continuation of Ser. No. 177,161, Aug. 11, 1980, abandoned. This application May 12, 1982, Ser. No. 377,490

Claims priority, application Japan, Aug. 17, 1979, 54-104683; Jun. 30, 1980, 55-88756

Int. Cl.³ C07G *7/00*

U.S. Cl. 260—112 R **23 Claims**



1. A protein substance, called RBF-PM, having an amino acid composition consisting essentially of:

	% by weight
aspartic acid	8–12
threonine	1–5
serine	1–5
glutamic acid	11–16
proline	1–5
glycine	4–8
alanine	5–9
cystine	less than 0.1
valine	7–12
methionine	1–3
leucine	8–16
isoleucine	4–8
tyrosine	2–5
phenylalanine	5–9
lysine	3–6
histidine	1–5
arginine	4–9

said substance having an elemental analysis as follows:

	% by weight
carbon	47–54
hydrogen	6–8

-continued

	% by weight
nitrogen	12–15

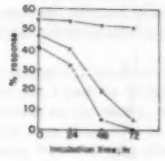
said substance containing from 0 to 8% by weight of saccharide, determined by the phenol-sulfuric acid method, said substance having an infrared spectrum as shown in FIG. 2 of the attached drawings, said substance having molecular weights mainly distributed in both of the ranges of 30,000–50,000 and 70,000–120,000, said substance having an isoelectric point in the range of pH3 to pH6, said substance being insoluble in dilute aqueous sodium chloride solution and dilute aqueous acid and being soluble in dilute aqueous alkaline solution.

4,457,864

SYNTHETIC ANALOGUES OF α-MELANOTROPIN

Victor J. Hruby; Mac E. Hadley; Christopher B. Heward, all of Tucson, Ariz., and Tomi K. Sawyer, Kalamazoo, Mich., assignors to University Patents, Inc., Norwalk, Conn.

Filed Oct. 23, 1981, Ser. No. 314,387
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R 3 Claims



1. A tridecapeptide of the formula:

Ac-Ser[1]-Tyr[2]-Ser[3]-Y[4]-Glu[5]-His[6]-X[7]-Arg[8]-Trp[9]-Gly[10]-Lys[11]-Pro[12]-Val[13]-NH_2

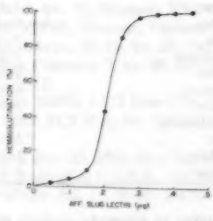
X is D-phenylalinine Y is methionine or norleucine, and all remaining amino acid residues in said tridecapeptide are in L-isomeric configuration.

4,457,865

SIALIC ACID SPECIFIC SLUG LECTIN

Ronald L. Miller, Charleston, S.C., assignor to Research Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,378
Int. Cl.³ C07G *7/00*
U.S. Cl. 260—112 R 11 Claims



1. The substantially homogeneous lectin of the slug, *Limax flavus* having a hemagglutinative inhibitory specificity and selectivity for sialic acid or sialoprotein, having an approximate amino acid composition:

Amino Acid	Moles per 22,000 g of lectin (Nearest Integer)
Asx	26
Thr	13
Ser	13
Glx	14
Pro	4
Gly	22
Ala	16
Val	7
Met	2
Ile	7
Leu	15
Tyr	10
Phe	10
His	7
Lys	17
Trp	6
Arg	8
Cys	6

4,457,866

CHROMOGENIC COMPOUNDS AND THEIR USE AS ENZYME SUBSTRATES

Hermann E. Karges; Helmut Heber, both of Marburg an der Lahn; Rainer Uhmann, Kriftel; Volker Teetz, Hofheim am Taunus, and Rolf Geiger, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Continuation of Ser. No. 185,007, Sep. 8, 1980, abandoned. This application Oct. 19, 1982, Ser. No. 435,610
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1979, 2936543
Int. Cl.³ C07C *103/52*; C12Q *1/00*
U.S. Cl. 260—112.5 R 4 Claims

1. A compound of the formula

W—P—B—X—NH—R

wherein W is R_1CO— wherein R_1 is C_1–C_6 aliphatic hydrocarbon, C_6–C_{10} aromatic hydrocarbon, C_7–C_{10} araliphatic hydrocarbon; or C_6–C_{10} alkaryl, or W is R_2OCO— wherein R_2 is C_1–C_6 aliphatic hydrocarbon, C_7–C_{10} araliphatic hydrocarbon, or $alkyl_{1-6}$ $sulfonylalkyl_{2-6}$, or

W is benzenesulfonyl or C_7–C_{10} alkarylsulfonyl;

P is valine, serine, Phe-Pro, Val-Glu-Gly, Val-Leu, Gly-Pro-Glu-Gly, or Ile-Glu-Gly, side chain groups of which may be substituted by protective groups;

B is arginine, lysine, phenylalanine, tyrosine, or homoarginine;

X is an L-amino acid selected from the group consisting of phenylalanine, tyrosine, valine, leucine, serine, glycine, and Leu-Phe, side chain groups of which may be substituted by protective groups; and

R is an aromatic hydrocarbon, which may be substituted; wherein X—NH—R is a chromogenic group which is cleaved by hydrolytic enzymatic action to form a compound H_2N—R, the amount of which can be measured by photometric, spectrophotometric, or fluorescence-photometric methods.

4,457,867

PHYSIOLOGICALLY ACTIVE PEPTIDE

Torao Ishida, Chiba, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 17, 1982, Ser. No. 450,721
Claims priority, application Japan, Dec. 24, 1981, 56-213763
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R 4 Claims

1. A physiologically active peptide represented by the following formula (I):

$$BCysX_1CysX_2CysX_3 \quad (I)$$

wherein B stands for a hydrogen atom or a methionyl group, Cys a cysteine residue, X_1 5 to 9 amino acid residues, X_2 one amino acid residue, and X_3 138 to 148 amino acid residues.

4,457,868

METHOD FOR ESTERIFICATION

Milton Braid, Haddonfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 2, 1981, Ser. No. 298,666
Int. Cl.³ C11C *3/10*
U.S. Cl. 260—404 **17 Claims**

1. A method for carrying out an ester interchange reaction between a carboxylic acid ester and a hydroxylamine of the formula

Ar NH Ar' ROH

wherein Ar and Ar' are phenyl, naphthyl or phenanthryl and R is a C_1 to C_{20} alkyl group or a C_1 to C_{20} hydroxy-substituted alkoxy group comprising conducting said reaction in the presence of a minor amount of a catalyst system comprising a mixture of metallic sodium and aluminum isopropoxide.

4,457,869

OILSEED EXTRACTION PROCESS

Frank N. Grimsby, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 7, 1982, Ser. No. 376,085
Int. Cl.³ C07F *5/02*; C11B *1/00*
U.S. Cl. 260—412.4 **6 Claims**

1. In a process for the recovery of oils from seeds containing extractible oils, comprising steps for contacting the seeds with an isopropanol-based extraction solvent in an extractor to obtain a miscella extract of seedoil and solvent and a seed meal containing absorbed extraction liquid, cooling and phase-separating the miscella to recover solvent, and recovering solvent from the meal by evaporation, the improvement which comprises steps for mechanically draining at least a portion of the absorbed liquid from the meal prior to recovering solvent from the meal by evaporation, and recycling the drained liquid to the extractor as isopropanol-based solvent.

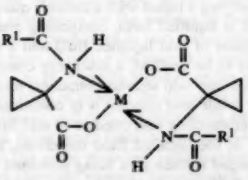
4,457,870

REGULATING PLANT GROWTH WITH NOVEL 1-AMINO-CYCLOPROPANECARBOXYLIC ACID METAL COMPLEXES

Rolf Schröder, Wuppertal-Elberfeld, and Klaus Lürssen, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 9, 1982, Ser. No. 406,680
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133917
Int. Cl.³ C07F *11/00, 3/06, 15/02, 15/04*
U.S. Cl. 260—429 R **11 Claims**

1. A 1-amino-cyclopropanecarboxylic acid metal complex of the formula



in which R^1 is a hydrogen atom or an alkyl or phenyl radical, and M is a transition metal atom which can assume the coordination number 4.

4,457,871

PREPARATION OF TRANS CYCLOHEXANE,1,4-DIISOCYANATE AND RELATED COMPOUNDS

Hans Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 215,415, Dec. 11, 1980, Pat. No. 4,418,211, which is a division of Ser. No. 049,112, Jun. 18, 1979, Pat. No. 4,275,223, which is a division of Ser. No. 883,949, Mar. 6, 1978, Pat. No. 4,203,916. This application Sep. 20, 1982, Ser. No. 420,185
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1972, 27105959
Int. Cl.³ C07C *118/00, 119/045*
U.S. Cl. 260—453 P **1 Claim**

1. A process for preparing a trans-cyclohexane-1,4-diisocyanate which comprises (a) reacting ammonia with cyclohexane-1,4-dicarboxylic acid, or a lower alkyl ester, a glycol ester, an oligomeric ester or a polyester thereof or a mixture of such compounds at an ammonia partial pressure of from 0.1 to 50 bar in a polyhydric alcohol at a temperature of from about 25° C. to about 200° C., (b) separating the resulting solid dicarboxylic acid diamide precipitated under these conditions from the reaction mixture, (c) freeing the solid diamide from water soluble constituents adhering thereto, (d) suspending the resulting solid diamide in an aqueous mineral acid or in water, (e) chlorinating the diamide at a temperature of from 0° C. to 40° C. to form cyclohexane-1,4-dicarboxylic acid-bis-N-chloramide, (f) reacting the chloramide with a monohydric alcohol, a polyhydric alcohol, or a carbocyclic or heterocyclic phenol which is capable of at least partly dissolving an alkali metal or alkaline earth metal hydroxide in the presence of said alkali metal or alkaline earth metal hydroxide to form trans-cyclohexane-1,4-diurethane, and (g) heating said trans-cyclohexane-1,4-diurethane to form trans-cyclohexane-1,4-diisocyanate.

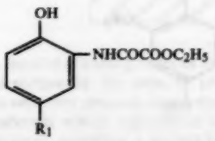
4,457,872

2-HYDROXYOXANILIC ACID DERIVATIVES

Kiyoshi Murase, Saitama; Toshiyasu Mase, Chiba; Hideki Arima, Tokyo; Kenichi Tomioka, and Yoso Numasaki, both of Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Tokyo, Japan

Continuation of Ser. No. 208,299, Nov. 19, 1980, abandoned. This application Sep. 9, 1982, Ser. No. 416,317
Claims priority, application Japan, Nov. 28, 1979, 54-153935; Oct. 7, 1980, 55-139297; Oct. 7, 1980, 55-139298; Oct. 29, 1980, 55-151816
Int. Cl.³ C07C *121/75, 79/46*
U.S. Cl. 260—465 D **4 Claims**

1. A 2-hydroxyoxanilic acid derivative represented by the following formula and the pharmaceutically acceptable salts thereof:



wherein R_1 is an amino group, an acetamido group, or a cyano group.

4,457,873

PROCESS FOR PREPARING PHOSPHONOMETHYLATED AMINO ACIDS

Sreeramulu Nagubandi, Bedford Hills, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 24, 1983, Ser. No. 478,192
Int. Cl.³ C07F 9/38
U.S. Cl. 260—502.5 F 16 Claims

1. A process for preparing a phosphonomethylated amino acid comprising:

phosphonomethylating a N-carboxymethyl-S-methylene bisdithiocarbamate to obtain a phosphonomethylated bisdithiocarbamate; hydrolyzing said phosphonomethylated bisdithiocarbamate to form a phosphonomethylated amino acid salt; and

acidifying said phosphonomethylated amino acid salt to obtain a phosphonomethylated amino acid or acid derivative.

4,457,874

CONDENSATION PRODUCTS OF SUBSTITUTED PHENOL SULFONIC ACID AND FORMALDEHYDE

John G. Papalos, Ledgewood, and Arpad Savoly, Martinsville, both of N.J., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Continuation-in-part of Ser. No. 294,337, Aug. 19, 1981, abandoned. This application Jul. 9, 1982, Ser. No. 396,698
Int. Cl.³ C07C 143/42
U.S. Cl. 260—512 C 14 Claims

1. A condensation product and salts thereof selected from the group consisting of

(a) condensation product of a substituted phenol sulfonic acid selected from the group consisting of an arylphenol sulfonic acid and an aralkylphenol sulfonic acid with from about 0.5 to about 4 moles of formaldehyde per mole of substituted phenol sulfonic acid, and

(b) condensation product of (i) a substituted phenol sulfonic acid selected from the group consisting of an arylphenol sulfonic acid and an aralkylphenol sulfonic acid and (ii) an aryl sulfonic acid with from about 0.5 to about 4 moles of formaldehyde per mole of substituted phenol sulfonic acid and aryl sulfonic acid wherein the weight ratio of substituted phenol sulfonic acid to aryl sulfonic acid is from about 0.95:0.05 to about 0.05:0.95.

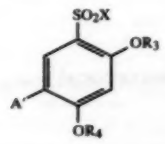
4,457,875

SUBSTITUTED 2,4 DIALKOXY BENZENE SULFONYL CHLORIDES

Jean-Paul Fournier, Versailles, and Patrick Choay, Paris, both of France, assignors to Choay S.A., Paris, France

Filed Apr. 23, 1982, Ser. No. 371,451
Claims priority, application France, Apr. 23, 1981, 81 08126
Int. Cl.³ C07C 147/06
U.S. Cl. 260—543 R 4 Claims

1. Sulfohalides of the formula:



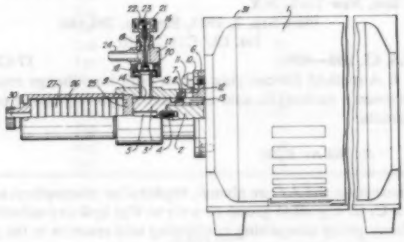
wherein X is a halogen, A' is an alky sulfonyl group having 1 to 4 carbon atoms, and R_3 and R_4 represent independently of one another, a lower alkyl group having 1 to 4 carbon atoms.

4,457,876

MACHINE FOR PRODUCING WHIPPED CREAM AND OTHER AERATED FOOD PRODUCTS

Frederick C. Brand, Thurston, England, assignor to Jack Macmanus Research Limited (Great Britain), London, England

Filed Dec. 3, 1982, Ser. No. 446,614
Claims priority, application United Kingdom, Dec. 4, 1981, 8136720
Int. Cl.³ B01F 3/04
U.S. Cl. 261—28 10 Claims



1. A machine for producing aerated food products comprising a motor-driven pump having an inlet connected both to an air suction intake and to a liquid product suction intake which is, in use, connected through a suction tube to an unpressurised liquid product container, whereby in use liquid product and air are simultaneously drawn into said pump, said pump having an outlet connected to a product discharge outlet through a flow path which incorporates a static homogenizer for emulsifying the mixture; wherein said motor and said pump are arranged end to end with the axes thereof substantially horizontal; a rotor of said pump is carried by and fixed to a driven shaft of said motor; and a space between a seal at the end adjacent to said motor of a pump chamber, in which said rotor works, and said motor is vented to atmosphere via vent means.

4,457,877

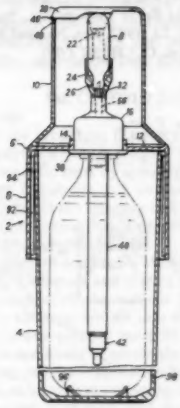
FLUID GASIFICATION APPARATUS

James P. Love, 2 Chestnut Close, Market Bosworth, Nuneaton, Warwicks, CV13 OLR, and Syed O. Z. M. Rafique, Knowle House, Knowle Hill, Kenilworth, Warwicks, CV8 2DZ, both of England

PCT No. PCT/GB81/00173, § 371 Date Apr. 16, 1982, § 102(e) Date Apr. 16, 1982, PCT Pub. No. WO82/00778, PCT Pub. Date Mar. 18, 1982
PCT Filed Aug. 28, 1981, Ser. No. 373,493
Claims priority, application United Kingdom, Sep. 1, 1980, 80 28130; Oct. 10, 1980, 80 32809; Mar. 30, 1981, 81 09914; Jul. 30, 1981, 81 23433
Int. Cl.³ B01F 3/04
U.S. Cl. 261—64 B 23 Claims

1. Apparatus for gasifying a liquid with a discrete quantity of a fluid that is supplied in liquified form, comprising means for retaining a first container of said liquified fluid and a second container of the liquid to be gasified, a discharge conduit for the passage of the fluid into said second container, means for sealing said container while said conduit is in communication therewith, means for connecting said conduit to said first container for the release of the liquified fluid therefrom, at least one flow path of extended surface area being provided within said conduit for said fluid, said at least one flow path being formed in a material providing a heat source for said fluid,

whereby the fluid is caused to flow in intimate contact with said material for heat exchange therewith to absorb from said



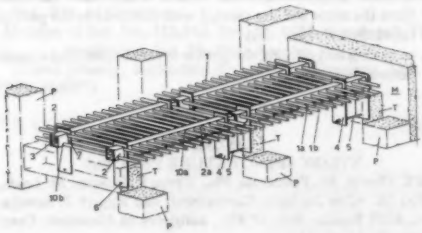
material the heat required to convert the fluid to a dry gaseous state.

4,457,878

FILLING FOR EMERGENCY COOLING TOWERS TO BE USED IN NUCLEAR POWER PLANTS

Jacques Meytsar, Milan, Italy, assignor to Favra International s.r.l., Milan, Italy

Filed May 26, 1982, Ser. No. 382,343
Claims priority, application Italy, Jun. 4, 1981, 22134 A/81
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—111 **6 Claims**



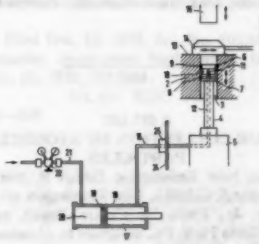
1. An improved filling for emergency towers of nuclear power plants which comprises horizontal grid-like layers or hurdles formed of parallel plastics tubes passing through elongated support elements of the same material and perpendicular to the tubes, wherein said elements have on a pair of opposite walls two corresponding, mutually facing pluralities of equally staggered holes, arranged in two parallel, horizontal, and spaced apart rows for the passage of said tubes which are also arranged on each layer in two horizontal, parallel rows, being spaced apart of such a distance as to enable an additional auxiliary tube to be forcedly inserted under a slight strain between said two rows of tubes in the direction of said support elements and between said two opposite walls and an auxiliary tube so located, there being further provided vertical fastening plates also of the same material, each having an opening for said support elements passing therethrough and anchoring means for fixing to the frame structures of the tower.

4,457,879

METHOD FOR PRODUCING PRESSED BLANKS FROM CERAMIC POWDER, FOR INSTANCE NUCLEAR REACTOR FUELS

Manfred Adelmann, Bruchköbel, and Rainer Löb, Obernburg, both of Fed. Rep. of Germany, assignors to Alkem GmbH, Hanau, Fed. Rep. of Germany

Filed Dec. 24, 1981, Ser. No. 334,249
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1980, 3049326
Int. Cl.³ G21C *21/00*
U.S. Cl. 264—0.5 **11 Claims**



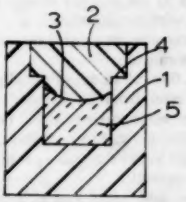
1. An intermittent method for producing molded blanks of ceramic powder in a mold of a molding device, said device having a die with a hole and a plunger with a head movable in said hole of the die, which comprises introducing a lubricant in said hole, moving said head in the hole of the die to form a continuous, thin film of lubricant on the wall of the hole, introducing ceramic powder free of a lubricant binder into the hole with a film of lubricant on its wall, compressing the powder in the hole between said head of said plunger and an upper plunger with a cross section fitted to the cross section of the hole to produce a molded blank, and discharging the molded blank from the hole, said lubricant being a paste or wax-like material and having a dripping point determined according to German Standard DIN 51 801, Sheet 1, of May 1972 higher than the operating temperature of the mold formed by the die and the head of the plunger and thereafter repeating said method to produce additional molded blanks.

4,457,880

METHOD OF MAKING CONTACT LENS BLANKS

Charles W. Neefe, 811 Scurry St., P.O. Box 429, Big Spring, Tex. 79720

Filed Feb. 15, 1983, Ser. No. 466,527
Int. Cl.³ B29D *11/00*
U.S. Cl. 264—1.4 **4 Claims**



3. A method of casting resinous lens blanks having a concave optical surface by the steps of providing a convex optical surface on a first resinous upper mold selected from the resinous materials which will adhere to the lens material when polymerized, providing a second lower non-optical concave mold from a selected resinous material which will not adhere to the polymerized solid lens material, placing a selected liquid

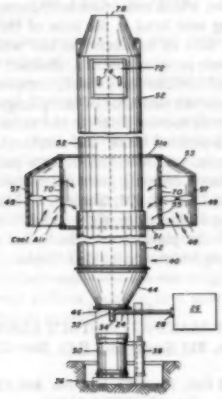
lens monomer in the second concave mold, placing the first convex optical surfaced mold within the second concave mold to a predetermined location, displacing the liquid lens monomer around the first convex optical mold, allowing the molds and liquid lens monomer to remain quiescent until particulate matter present in the liquid lens monomer migrates away from the upper optical surfaced mold, allowing the liquid lens monomer to polymerize forming a solid lens blank adhering to the first convex optical surfaced resinous mold and releasing from the concave non-optical resinous mold, removing the solid resinous lens blank from the second non-optical concave mold while attached to the first convex optical surfaced mold, forcibly removing the lens blank from the first convex optical surfaced mold.

4,457,881

METHOD FOR COLLECTION OF ATOMIZED METAL PARTICLES

A. David Booz, New Kensington; Daniel R. Barch, Natrona Heights; Walter S. Cebulak, New Kensington, all of Pa.; John B. Kapustay, Jr., Pocos De Caldas, Brazil, and Adam J. Sartschev, Allison Park, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 10, 1982, Ser. No. 416,603
Int. Cl.³ B01J 2/04
U.S. Cl. 264—12 **7 Claims**



1. An improved method for the production of particulate metal characterized by the absence of any fans in the metal particle gas stream which comprises:

(a) providing a containment vessel comprising a cylindrical wall and a bottom wall;

(b) introducing a flow of atomized metal particles into said containment vessel from an external source of metal through nozzle means carried by said bottom wall;

(c) drawing a collection gas to cool and collect said metal particles into said vessel through a gas ingress port spaced from said bottom wall;

(d) sweeping from said vessel said collection gas and said atomized metal particles through an exit port into a separator; and

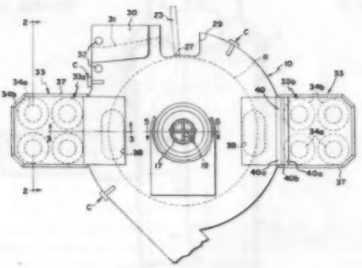
(e) aspirating gas from the discharge side of said separator whereby said collection gas is drawn into said containment vessel and said collection gas sweeps said atomized metal particles from said vessel into said separator without said atomized metal particles coming into contact with fans or blowers.

4,457,882

CENTRIFUGALLY POWERED PELLETIZING MACHINE AND METHOD

David B. Todd, Saginaw, and James D. Layfield, Bay City, both of Mich., assignors to Baker Perkins Inc., Saginaw, Mich.

Filed Dec. 13, 1982, Ser. No. 448,976
Int. Cl.³ H05B 1/00
U.S. Cl. 264—25 **22 Claims**



1. In a method for forming pellets of theroplastic material by centrifugally expressing strands of flowable thermoplastic material from orifices in the rim portion of a rotating hollow rotor bounded radially by a housing chamber, and severing said strands at a selected location adjacent the periphery of said rotor to form pellets; the steps of

a. providing a feed tube having an exit end which communicates with the rotating hollow rotor generally axially to deliver the thermoplastic material to the rotor;

b. dividing the outflow in the exit end of the tube into a plurality of radially diverging streams which uniformly distribute the flow to the rotor;

c. accelerating the streams to approximately the speed of rotation of the rotor;

d. positioning a cutter in the chamber across the path of rotation of portions of the strands which have extruded from the rotor and are carried with the rotor in the path of revolution thereof; and

e. receiving and cooling the pellets severed from said strands before they agglomerate.

4,457,883

NYLON SPIN-TEXTURE PROCESS

Paul T. Howse, Jr., Pensacola, Fla.; Byron E. Beasley, St. Louis, Mo.; M. Allan Jacques, Cantonment, and Rupert J. Snooks, Jr., Gulf Breeze, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 23, 1982, Ser. No. 444,008
Int. Cl.³ D01D 5/22
U.S. Cl. 264—168 **3 Claims**

1. In a process for producing a nylon 66 yarn having latent crimp wherein molten fiber-forming nylon 66 is extruded throughput through a spinneret to provide a monocomponent multifilament yarn that is quenched, passed with a given number of wraps around a feed roll and its associated idler roll, wherein the feed roll is heated to a temperature ranging from 100° to 175° C. and drawn a draw ratio ranging from 1.25 to 3.25 before being collected, wherein the latent crimp level of the yarn is controlled by making adjustments in the throughput, temperature of the feed roll, number of wraps and/or draw ratio and wherein there is a maximum throughput beyond which the latent crimp is no longer capable of being controlled by making said adjustments, the improvement of increasing said maximum throughput by incorporating calcium fluoride into the nylon 66 prior to extrusion.

4,457,884

CONTINUOUS DRY-SPINNING PROCESS FOR ACRYLONITRILE FILAMENTS AND FIBRES

Ulrich Reinehr, Dormagen, and Hans Uhlemann, Solingen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 505,544

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1982, 3225266

Int. Cl.³ D01D 5/22

U.S. Cl. 264—168 9 Claims

1. A process for preparing filaments and fibres made of of acrylonitrile polymers which contain at least 40 percent by weight of acrylonitrile units by spinning a spinning solution of the polymer into a spinning cell, evaporating at least some of the spinning solvent in the spinning cell, spin-finishing, stretching, crimping, heat-setting and, if desired, cutting in a continuous operation, characterized in that

(a) spinning solution spun has a viscosity at 100° C. of 10 to 60 falling-ball seconds and is spun through a spinning jet,

(b) the evaporation of the solvent in the spinning cell is effected by blowing hot air into the spinning cell at the head thereof at a point at most 50 centimeters below the spinning jet and along or across the filaments issuing from said spinning jet, the evaporation being controlled in such a way that on leaving the spinning cell the solvent content of the filaments is at most 40% by weight, relative to to the solids content of the fibre,

(c) before the stretch the filaments are treated with a spin-finish which contains a lubricant and an antistat and gives the filaments a moisture content of at most 10% by weight, relative to the solids content of the fibre, and

(d) before the stretch the filaments have no contact with any other extraction liquid for the spinning solvent.

4,457,885

PROCESS FOR THE PRODUCTION OF DRY-SPUN HOLLOW POLYACRYLONITRILE FIBERS AND FILAMENTS

Ulrich Reinehr; Kurt Bernklau, both of Dormagen; Hans K. Burghartz, Neuss; Toni Herbertz, Dormagen, and Hermann-Josef Jungverdorben, Grevenbroich, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 311,493, Oct. 15, 1981, abandoned. This application Jan. 28, 1983, Ser. No. 461,803

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3040971

Int. Cl.³ D01F 6/18

U.S. Cl. 264—177 F 9 Claims

1. A process for the production of hollow acrylonitrile fibers and filaments, comprising spinning solutions of filamentforming synthetic polymers through a nozzle having loop-shaped nozzle orifices by a dry spinning process, the solution having a viscosity equivalent to at least 120 falling ball seconds, measured at 80° C., or at least 75 falling ball seconds, measured at 100° C., wherein the nozzle orifice area of the profiling nozzle is smaller than 0.2 mm² and the maximum width of the sides of the loop-shaped nozzle is 0.1 mm and the overlap between the two ends of the sides of the loop-shaped nozzle forms an angle of from 10° to 30° measured from the center of the nozzle and wherein the spinning air acts on the filaments in a transverse direction to the filament take-off and the air direction forms an angle of from 80° to 100° with a straight line passing through an opening between the sides.

4,457,886

PROCESS FOR THE PRODUCTION OF COUPLING PIECES FROM A THERMOPLASTIC, AND DEVICE FOR CARRYING OUT THIS PROCESS

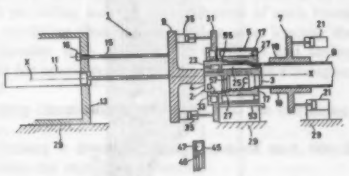
Petrus M. Acda, and Jacob Karreman, both of Enkhuizen, Netherlands, assignors to Polva-Nederland B.V., Enkhuizen, Netherlands

Filed Dec. 12, 1979, Ser. No. 102,654

Claims priority, application Netherlands, Dec. 12, 1978, 7812064; Dec. 12, 1978, 7812065

Int. Cl.³ B29C 7/00

U.S. Cl. 264—249 4 Claims



1. Process for the production of coupling pieces from a thermoplastic, which coupling pieces possess an undercut annular groove, in which process a sleeve having a free end and a terminal part adjacent the free end is initially preformed on the end of a pipe of thermoplastic material to have an internal diameter which increases in steps in the direction of the free end, the terminal part of the preformed sleeve is then postformed in order to form the undercut annular groove and, finally, the postformed sleeve is cooled, characterised in that, at the completion of preforming, the terminal part of the preformed sleeve is kept at a temperature which is such that the said terminal part remains elastically deformable, in order to permit postforming of the preformed sleeve, whilst the remainder of the preformed sleeve is cooled to a temperature which is such that the said remainder is no longer deformable.

4,457,887

PROCESS FOR REACTION INJECTION MOLDING OF SILICONE CONTAINING POLYURETHANES

Arthur F. Porsche, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 19, 1982, Ser. No. 409,489

Int. Cl.³ B29F 1/00; C08G 18/08, 18/61

U.S. Cl. 264—300 5 Claims

1. In a process of reaction injection molding of polyurethanes which include the mixing of one or more of each of polyols, isocyanates, and catalysts, the reaction of the foregoing ingredients, and the molding and curing of the foregoing mixture into the desired configuration, the improvement comprising mixing with the other ingredient 0.2 to 10 weight percent based on the weight of the total ingredients of a silicone mold release agent selected group consisting of

$$Z_{4-c}SiG_c \text{ and}$$
$$R_{3-d}G_dSiO(Y_{2-b}G_bSiO)_aSiG_cX_{3-c}$$

wherein Z, R, Y, and X are selected from the group consisting of hydrogen, substituted and unsubstituted hydrocarbon radicals, and mixtures thereof; G is a radical of the structure —D-$(OR'')_mOH$ wherein D and R'' are selected from the group

consisting of substituted and unsubstituted hydrocarbon radicals, and m has a value of 1 to 50; a has a value of 1 to 4; d and c have values of 0 to 3, and b has a value of 0 to 2 wherein d, c, or b has a value of at least 1; and n has a value of 0 to 350.

4,457,888

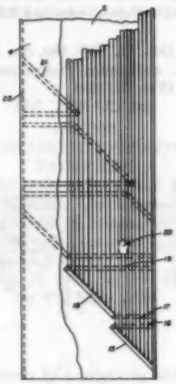
NUCLEAR POISON BOX BASE CONSTRUCTION

Richard A. Vickrey, Jr., Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 22, 1982, Ser. No. 351,064

Int. Cl.³ G21C *19/00*

U.S. Cl. 376—272 **6 Claims**



1. In a nuclear fuel storage box of polygonal cross-sectional configuration formed of a plurality of vertical side panels joined together along their longitudinal edges, said box being open at the top for insertion of nuclear fuel rods, two of said side panels being joined to form a first elongated interior corner of said box, the improvement comprising a base structure for the lower interior end of said storage box, said base structure including a plurality of steps which substantially cover said lower end and lead from said first elongated interior corner to an opposite interior corner of said box, said steps including

a first step mounted within said box at its lower end providing an upper surface slanting downward toward the interior corner of the box for receiving the lower end of a fuel rod extended up along said first elongated interior corner,

and a second step providing an upper surface extending between two interior panel walls of the box and slanted downward toward and terminating a predetermined distance above and over the surface of the first step,

whereby fuel rods are inserted in the box and supported by the upper surface of the first step and the upper surface of the second step after the surface of the first step is completely occupied.

4,457,889

PROCESS AND DEVICE FOR EMERGENCY COOLING OF A NUCLEAR REACTOR

Alain Vienne, Andresy, France, assignor to Framatome, Courbevoie, France

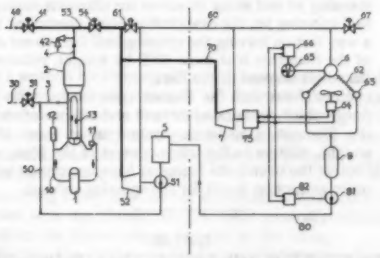
Filed Jul. 1, 1981, Ser. No. 279,406

Claims priority, application France, Jul. 25, 1980, 80 16432

Int. Cl.³ G21C *15/18*

U.S. Cl. 376—282 **2 Claims**

1. A nuclear reactor system emergency cooling process comprising at least one primary coolant circuit (**10**) for the heating of secondary coolant water in a steam generator (**2**), and a secondary circuit (**3**) for feeding with said secondary coolant water and for evacuation (**4**) of the steam produced in said generator through indirect contact of the secondary coolant water with the coolant of said primary circuit, an emergency feed water circuit for said secondary circuit, said emergency feed water circuit comprising a water reservoir (**5**) connected to a water feed pipe by a circuit (**50**) for emergency feeding comprising a first auxiliary pump (**51**) driven by a first auxiliary turbine (**52**) actuated by steam drawn off by means of a pipe (**53**) connected in by-pass to said circuit (**4**) for evacuation of the steam of said generator, an air condenser associated with a blower and with a vacuum system for maintaining a vacuum in said air condenser, a first conduit connected between said steam evacuation circuit and said air condenser for supplying steam to said air condenser, a second conduit connecting said air condenser to said water reservoir for recycling water condensed in said air condenser to said water reservoir, said second conduit having a second auxiliary pump for effecting the recycling of said condensed water to said reservoir, means for actuating said second auxiliary pump and said blower and said vacuum system, a third conduit for supplying steam from said steam evacuation circuit to a second auxiliary turbine for actuating said actuation means, comprising the steps of



(a) condensing at least one portion of the steam produced in said generator in said air condenser using another portion of said steam for actuating said blower and said vacuum system using said second auxiliary turbine;

(b) recycling the water resulting from condensation of said at least one portion to said reservoir, utilizing a third portion of said steam for actuating said first auxiliary turbine and recycling the water from said reservoir to said water feed pipe using said first auxiliary pump;

(c) directing some of said another portion of said steam toward said second auxiliary turbine immediately upon the start of said emergency cooling process, whereby to control the start-up of said air condenser, evacuating the remainder of said another portion of to atmosphere and then progressively diverting said remainder of said another portion of steam to said air condenser after operation thereof has commenced, the portion discharged to atmosphere diminishing to nothing when the condensation capacity of said air condenser corresponds to the production of steam, whereby cooling proceeds in a closed circuit until said generator is completely cooled.

4,457,890

LIQUID METAL COOLED NUCLEAR REACTORS

Donald Scott, Northwich, England, assignor to National Nuclear Corporation, London, England

Filed Feb. 6, 1981, Ser. No. 232,289

Claims priority, application United Kingdom, Feb. 8, 1980, 8004367

Int. Cl.³ G21C *3/00, 9/00*

U.S. Cl. 376—362 **5 Claims**

1. A liquid metal cooled nuclear reactor comprising:

a vessel for containing a pool of liquid metal coolant;

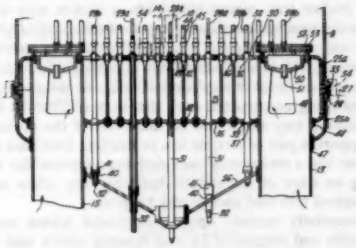
a fuel assembly positioned to be submerged in the pool of coolant;

a generally cylindrical plenum for containing inlet pressure liquid metal coolant for the fuel assembly and having an upper plate and a lower plate;

a load-bearing undershell for providing a secondary containment for coolant;

an array of resilient spikes upstanding from said upper plate, the fuel of said fuel assembly being carried on said spikes;

an array of spaced strut members less in number than the number of said spikes and extending downwardly from



said upper plate to said undershell so as to directly support only certain ones of said spikes, other ones of said spikes without direct strut member support being supported in bushes in said upper plate and in said lower plate so that fuel dead-weight is distributed over said plenum; and,

means for supporting said plenum on said strut members and said strut members on said undershell so that said fuel dead-weight is transmitted from said plenum to said undershell by said strut members without compression loading of said plenum.

4,457,891

HYDROGEN STORAGE ALLOY

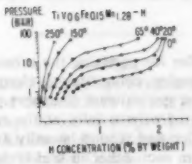
Otto Bernauer, Weinstadt, and Klaus Ziegler, Ostfildern, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 14, 1983, Ser. No. 475,367

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1982, 3210381

Int. Cl.³ C22C *30/00*; C01B *6/02*

U.S. Cl. 420—434 **9 Claims**



1. A hydrogen storage material comprising an alloy of the composition of 25 to 30.9% by weight of titanium, 10 to 42% by weight of vanadium and 27.1 to 65.1% by weight of manganese, where more than 2 up to at most 2.2 other atoms—in the alloy—are present per titanium atom.

4,457,892

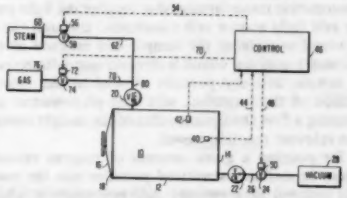
BIOCIDAL GAS STERILIZATION AND GAS LEAKAGE DETERMINATION

Jack H. Young, Cambridge Springs, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Feb. 6, 1979, Ser. No. 9,817

Int. Cl.³ A61L *2/20*

U.S. Cl. 422—2 **9 Claims**



1. Gas sterilization process utilizing a chemically biocidal gas and providing leakage determination of such biocidal gas from a sterilizing chamber comprising, after loading the sterilizing chamber with goods to be sterilized and sealing such chamber for operation at pressures other than atmospheric, the steps of

charging chemically biocidal gas into the sterilizing chamber,

establishing a desired concentration of such biocidal gas within the sterilizing chamber,

providing a sterilization phase at a pressure above atmospheric to complete desired sterilization including make-up charging of the chemically biocidal gas as required to maintain such biocidal gas concentration for an extended time period,

determining unacceptable leakage of the chemically biocidal gas from the chamber by quantitatively monitoring such make-up charging of the chemically biocidal gas, and

interrupting charging of chemically biocidal gas in response to such determination of unacceptable leakage.

4,457,893

AUTOMATED APPARATUS FOR PHOTOMETRICALLY DETECTING IMMUNOLOGICAL AGGLUTINATING REACTIONS

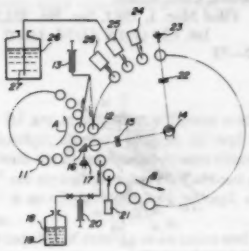
Hiroshi Takekawa, Kunitachi, Japan, assignor to Olympus Optical Co. Ltd., Japan

Division of Ser. No. 184,057, Aug. 28, 1980. This application Jul. 16, 1982, Ser. No. 398,870

Claims priority, application Japan, Sep. 10, 1979, 54-115103

Int. Cl.³ G01N *33/54, 35/02, 35/06*

U.S. Cl. 422—64 **8 Claims**



1. An apparatus for effecting an immunological analysis based on a reaction between an antibody and an antigen specific to said antibody comprising:

a turntable intermittently rotated in a horizontal plane about

a center axis in a given direction and having a plurality of reaction vessel holding portions arranged equidistantly along a periphery of the turntable;

means for pouring a given amount of sample containing antibody or antigen to be analyzed into a reaction vessel indexed at a sample delivery position;

a light source arranged in said center axis of the turntable for horizontally emitting light having a wavelength selectively absorbed by said antibody or antigen in the sample;

first photometric means arranged to receive the light emitted from said light source and transmitted through the reaction vessel containing the sample and indexed at a first photometry position which is downstream with respect to said sample delivery position viewed in the rotational direction of the turntable, said first photometric means measuring a first absorption value of the sample contained in the relevant reaction vessel;

means for pouring a given amount of reagent containing antigen- or antibody-sensitized particles into the reaction vessel indexed at a reagent delivery position which is downstream with respect to said first photometry position viewed in the rotational direction of the turntable to form a test liquid in the relevant reaction vessel;

means for transporting said reaction vessel from said first photometry position to a second photometry position in a substantially standstill manner so that the test liquid separates into supernatant and sediment;

second photometric means arranged to receive the light emitted from said light source and transmitted through a supernatant of the test liquid contained in the reaction vessel indexed at a second photometry position which is downstream with respect to said reagent delivery position viewed in the rotational direction of the turntable, said second photometric means measuring a second absorption value of a supernatant of the test liquid contained in the relevant reaction vessel and not of the sediment;

means for washing the reaction vessel indexed at a washing position which is downstream with respect to said second photometry position; and

calculating means for receiving said first and second absorption values measured by said first and second photometric means, to derive a difference therebetween which represents an analytic result of the antibody or antigen contained in the sample;

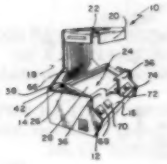
whereby said sample and reagent pouring means, first and second photometric means, and calculating means are actuated for each step of the intermittent rotation of the turntable to effect immunological analysis for successive samples.

4,457,894

SEMI-AUTOMATED AGGLUTINATION VIEWER FOR SEROLOGY TESTING

George H. Clark, and Mary A. Clark, both of 3112 Del Rey Ave., Carlsbad, Calif. 92008

Filed Mar. 1, 1982, Ser. No. 353,510
Int. Cl.³ G01N 33/54, 35/00
U.S. Cl. 422—73 **4 Claims**



1. A semi-automated agglutination viewer comprising a housing including a top and a front panel; and upright back bound to said housing; magnifying means mounted in retainer means attached essentially perpendicularly to said upright back for aiding viewing of any agglutination; rocker tray means rotatably supported by said housing within the top thereof; motor means including a shaft and encompassed by said housing; power source means electrically engaging said motor means to supply power to same for rotating said motor shaft; gear means connected to said motor shaft for rotational power take-off therefrom; and a rocker arm means attached to said rocker tray means and secured eccentrically to said gear means such as to vertically reciprocate the rocker arm means from rotary power take-off from the gear means to cause rocking of the tray means; a sample handling tray;

said rocker tray means comprises a rocker tray support having a rocker base having a pair of ears integrally bound to said rocker base and attaching the tray support to said housing, one of said pair of ears attaching said rocker arm means, said rocker tray support and said sample handling tray being constructed such that in operation the sample handling tray snaps into or snaps out of the rocker tray support, a pair of flexible lips protruding from said rocker base; and a rocker tray back defining a channel for receiving an edge of the sample handling tray when same is snapped into said rocker tray support,

an essentially arcuate optic background means enclosed within and supported by said housing above said motor means and said gear means; a lamp means electrically engaging said power source means and supported within and by said housing; and a fluorescent lamp means positioned in the corner of the adjoining point of said upright back and said magnifying retainer means, said fluorescent lamp means electrically engaged to said power source means;

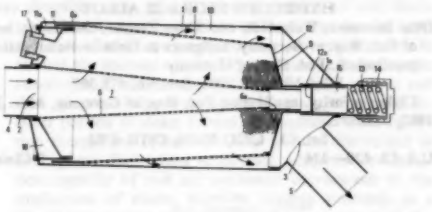
and a pair of light shields, one of which is situated over said lamp means and the other over said fluorescent lamp means.

4,457,895

CATALYTIC MUFFLER FOR PURIFYING THE EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

Michel Prigent, Rueil-Malmaison, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Oct. 13, 1982, Ser. No. 434,033
Claims priority, application France, Oct. 13, 1981, 81 19373
Int. Cl.³ F01N 3/10
U.S. Cl. 422—179 **9 Claims**



1. A catalytic muffler for purifying the exhaust gases of an internal combustion engine, comprising an elongate body having gas admission and gas exhaust chambers provided with respective ports located substantially at the respective two ends of the muffler; first and second laterally arranged perforate walls spaced from each other in said body to define an annular elongate space adapted for containing a particulate purification catalyst therein, said first and second perforate walls separating said gas admission and exhaust chambers, and at least said second perforate wall being slidably mounted in the longitudinal direction of the muffler within a sleeve passing through the wall of said tubular body; and catalyst compressing means associated with said slidable second perforate wall

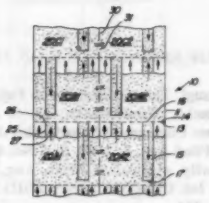
for acting thereon to reduce the volume of said annular space for compressing particulate catalyst contained therein, and wherein said catalyst compressing means is located outside said elongate body, and separated from said slidable second perforate wall by thermal insulating means, with said thermal insulating means being interposed between said catalyst compressing means and the bottom portion of said second lateral wall.

4,457,896

APPARATUS AND PROCESS FOR FLUIDIZED SOLIDS SYSTEMS

Hisashi O. Kono, Evanston, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed Aug. 2, 1982, Ser. No. 404,284
Int. Cl.³ F27B *15/08*; C10G *35/00*
U.S. Cl. 423—659 **8 Claims**



1. Apparatus for conducting reactions in fluidized solids comprising:

a vessel defining a continuous upward flow path for fluidizing gas sequentially through a plurality of vertically arranged fluidized bed zones;

means for introducing said fluidizing gas in a lower portion of said vessel and means for removing said fluidizing gas in an upper portion of said vessel;

a plurality of vertically arranged fluidized bed zones, each said fluidized bed zone having a baffle base plate having a plurality of apertures therethrough defining the lower boundary thereof, a dense homogeneous fluidized bed of said solids supported by said base plate, and a voidage space above said dense homogeneous fluidized bed extending to the lower boundary of an upper said vertically arranged fluidized bed zone;

at least one downcomer conduit for downward passage of said solids having a top opening in the lower portion of one of said dense fluidized beds, said downcomer conduit extending to and having a bottom opening in the lower portion of a lower of said dense fluidized beds and at least one riser conduit for upward pasage of said solids having a bottom opening in the upper portion or above the surface of one of said fluidized beds, said riser conduit extending to and having a top opening in the lower portion of an upper of said fluidized beds, and said riser conduit having a larger diameter than said apertures in said base plates.

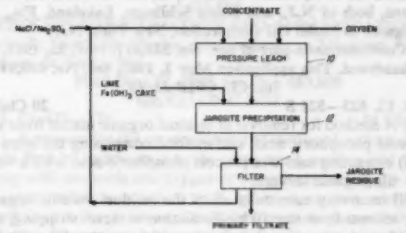
4,457,897

PROCESS FOR THE SELECTIVE DISSOLUTION OF COBALT FROM COBALTITE-PYRITE CONCENTRATES

Robert W. Stanley, Kirkland; Serge Monette, Longueuil, and Bryn Harris, Kirkland, all of Canada, assignors to Noranda Mines Limited, Toronto, Canada

Filed Sep. 28, 1982, Ser. No. 425,638
Int. Cl.³ C01G *51/00*
U.S. Cl. 423—141 **12 Claims**

1. A hydrometallurgical process for the recovery of cobalt from cobaltite-pyrite concentrates containing substantial amounts of cobalt, arsenic, iron and sulphur, with an excess of iron relative to arsenic of at least two to one, comprising pressure leaching of the concentrates with a sodium chloride or sodium sulphate solution at temperatures of 130°–160° C. and under oxygen partial pressures of 75–200 psi to solubilize most



of the cobalt content, while simultaneously limiting the oxidation of pyrite and precipitating most of the solubilized iron and arsenic as jarosite and ferric arsenate.

4,457,898

MANAGANESE COMPOUNDS AND SORPTION OF GASES USING MANGANESE COMPOUNDS

William E. Hill, Auburn, Ala., and Charles A. McAuliffe, Altrincham, England, assignors to Facilitated Separations, Ltd., Towson, Md.

, which is a continuation-in-part of Ser. No. 157,028, Jun. 6, 1980, abandoned. This application Apr. 30, 1982, Ser. No. 373,638
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—219 **15 Claims**

1. A method for the separation of a gas from a fluid containing said gas comprising

treating said fluid with a compound of the formula

$$Mn^{II}LX_2(Q)_n \quad (I)$$

wherein L represents a monodentate ligand of the formula

$$PR^1R^2R^3 \quad (II)$$

wherein

R^1, R^2, and R^3 are identical or different and represent alkyl, cycloalkyl, alkenyl, alkynyl, or aryl groups or hydrogen with the proviso that no more than two of R^1, R^2, and R^3 are aryl groups and that at least one of R^1, R^2, and R^3 is an alkyl, cycloalkyl, alkenyl, alkynyl, or aryl group,

X is a species capable of existing as an anion and is selected from the group consisting of Cl, Br, I, CN, NO_2, NO_3, OH, NCS, NCSe, and NCO,

Q is a solvento molecule that forms a chemical bond to the manganese, and

n is the number of solvent donor bonds to the maganese and is 1, 2, or 3 wherein the gas in said fluid is sorbed by said compound.

4,457,899

PROCESS FOR REMOVAL OF RESIDUAL ORGANIC MATTER FROM PURIFIED PHOSPHORIC ACID

Richard G. Grotyohann, Somerset; Byron E. Johnston, Skillman, both of N.J., and Robin Schlinger, Lakeland, Fla., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 323,517, Nov. 23, 1981, abandoned. This application May 2, 1983, Ser. No. 490,917

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—321 S 20 Claims

1. A method for removal of residual organic matter from wet process phosphoric acid, said method comprising the steps of:

(i) extracting said wet process phosphoric acid with a volatile organic solvent;

(ii) removing essentially all of the residual volatile organic solvent from step (i) by distillation or steam stripping; and

(iii) contacting the phosphoric acid from step (ii) with hydrogen peroxide at a temperature between about 100° C. and about 150° C., for between about ½ hour and about 4 hours, and using a weight ratio of hydrogen peroxide to phosphoric acid between about 0.001 and about 0.05.

4,457,900

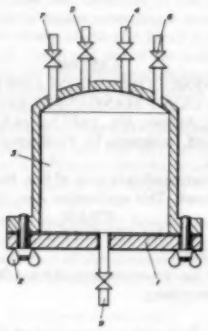
SILICIC ACID FOR THE FILTRATION OF BEVERAGES, PARTICULARLY BEER

Gerhard Steenken, Berzbuir bei Duren, Fed. Rep. of Germany, assignor to Akzona Incorporated, Asheville, N.C.

Filed Apr. 30, 1982, Ser. No. 373,476

Int. Cl.³ C01B *33/12*; B01D *39/14*

U.S. Cl. 423—339 5 Claims



1. Process for the preparation of finely divided silicic acid particles, which are simultaneously suitable as a filtering auxiliary and as a stabilizing agent for beer in the filtration thereof, said silicic acid particles being of an essentially spherical or spheroidal shape and having an SiO_2 content of at least 95% by weight, said content being based upon said particles after drying at about 110° C., an Na_2O content of less than 0.25% by weight, and wherein the pH value of said particles comprising a 10% suspension in water is from about 4 to 7, said particles further having a surface according to Carman no greater than 100 m^2/g. and said particles having a standard test filtration time t_o of 20 seconds to 6 minutes and a ratio of

$$t\frac{1000}{120}/t_o$$

of about 0.7 to 6.5, with

$$t\frac{1000}{120}$$

being the test filtration time after a stirring stress of 120 minutes at 1000 rpm, comprising forming an aqueous charge containing 0.4 to 2.0% dissolved common salt by weight, said charge being between 33% and 70% by volume of the final volume of said charge and said silicic acid after precipitation of particles of said silicic acid, and wherein said aqueous charge has added uniformly and separately thereto a sodium silicate solution and an acid to form a silicic acid suspension that contains said silicic acid, said sodium silicate solution being metered into said charge whereby the pH value in the charge is about 3 to 10 during the addition, the temperature of said charge being maintained between about 50° C. and 95° C. during said addition, adjusting the pH value of said silicic acid suspension to about 7 to 4 after termination of the addition, filtering said silicic acid, washing said silicic acid with water and immediately drying said silicic acid while avoiding elevated shear stresses, followed by screening said acid in the absence of grinding with the aid of a sieving device.

4,457,901

METHOD OF REFINING SILICON TETRAFLUORIDE GAS

Naomichi Kitsugi, Tokorozawa; Teruo Fujinaga, Kawagoe, and Toyozo Otsuka, Kamifukuoka, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Aug. 5, 1982, Ser. No. 405,384

Claims priority, application Japan, Aug. 6, 1981, 56-122457

Int. Cl.³ C01B *33/08*; B01D *53/34*

U.S. Cl. 423—341 10 Claims

1. A method of refining a silicon tetrafluoride gas containing hexafluorodisiloxane as impurity, the method comprising the step of making the silicon tetrafluoride gas contact with hydrogen fluoride in the presence of a liquid medium which has strong affinity for water thereby forcing said hexafluorodisiloxane to react with hydrogen fluoride.

4,457,902

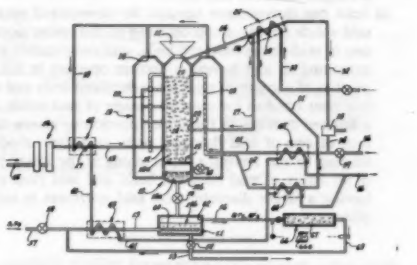
HIGH EFFICIENCY HYDROCARBON REDUCTION OF SILICA

Keith R. Watson, P.O. Box 1537, Sante Fe, Calif. 92067

Continuation of Ser. No. 200,529, Oct. 24, 1980, abandoned. This application Jan. 25, 1982, Ser. No. 342,725

Int. Cl.³ C01B *33/02*

U.S. Cl. 423—350 17 Claims



1. In the process of reducing SiO_2 in a retort to produce Si, the steps that include

(a) reacting SiO_2 with a saturated hydrocarbon at elevated temperature between 1,500° C. and 2,000° C. in said retort, to produce molten Si, and gases including SiO, CO, H_2 and H_2O,

(b) removing said gases from the retort and separating SiO in a first stream and CO and H_2 in a second stream,

(c) combusting said second stream with a third stream of air or O_2 in a combustion zone adjacent the retort to produce heat, and

(d) utilizing said heat to aid the reaction in the retort.

4,457,903
SEMICONTINUOUS PROCESS FOR THE PRODUCTION OF PURE SILICON

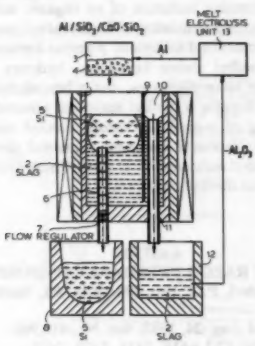
Josef Dietl, Neuötting; Claus Holm, Teising; Jörg Kotilge, Burghausen, and Michael Wohlschläger, Unterpfaffenhofen, all of Fed. Rep. of Germany, assignors to Heliotronic Forshungs und Entwicklungsgesellschaft fur Solarzellen Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 470,981

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208878

Int. Cl.³ C01B *33/02*

U.S. Cl. 423—350 **7 Claims**



1. A semicontinuous process for the production of pure silicon by reducing quartz with aluminum, comprising the steps of:

introducing quartz and aluminum batch-wise into a molten alkaline earth metal silicate slag present in a reaction vessel, whereupon said slag becomes enriched with dissolved aluminum oxide and silicon is formed which separates out from said slag,

removing said silicon in portions from said reaction vessel; and

regenerating said slag containing dissolved aluminum oxide by adding fresh slag material and removing a corresponding amount of said slag enriched with aluminum oxide from said reaction vessel.

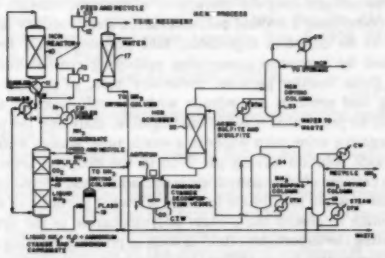
4,457,904
HYDROGEN CYANIDE PROCESS

James W. Gambell, St. Louis, Mo., and Steven R. Auvil, Macungie, Pa., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 9, 1982, Ser. No. 406,681

Int. Cl.³ C01C *3/02*

U.S. Cl. 423—376 **14 Claims**



1. A process for producing HCN which comprises bringing a mixture of gases containing CO and NH_3 at elevated temperatures and pressures into contact with a solid, water-insoluble catalyst having a protonic acid strength of at least 15 $meq/m^2 \times 10^4$.

4,457,905
PROCESS FOR OXIDATION AND AMMOXIDATION

Jerry R. Ebner, St. Charles, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1982, Ser. No. 453,089

Int. Cl.³ C01C *3/02*

U.S. Cl. 423—376 **14 Claims**

1. A process for the ammoxidation of methanol or formaldehyde feed to hydrogen cyanide comprising passing said feed along with ammonia and oxygen or oxygen-containing gas into an ammoxidation reaction zone operated at ammoxidation conditions in the presence of a catalyst consisting essentially of effective amounts of manganese and phosphorus and wherein the atomic ratio of manganese to phosphorus is within the range of 1:1 to 1.5:1.

9. A process for the production of carbonyl compounds comprising passing a feed of an alcohol and oxygen or oxygen-containing gas into a reaction zone operated at oxidation conditions and containing a catalyst consisting essentially of effective amounts of manganese and phosphorus and wherein the atomic ratio of magnanese to phosphorus is within the range of 1:1 to 1.5:1.

4,457,906
PREPARATION OF HYDROXYLAMMONIUM SALTS

Otto-Alfred Grosskinsky; Elmar Frommer; Guenther Rapp, all of Ludwigshafen, and Erwin Thomas, Freinsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,209

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130305

Int. Cl.³ C01B *21/14*

U.S. Cl. 423—387 **1 Claim**

1. In a process for the preparation of hydroxylammonium salts by catalytic reduction of nitric oxide with hydrogen in a dilute aqueous solution of a mineral acid in the presence of a suspended supported platinum catalyst and at elevated temperatures, the improvement wherein the reaction is carried out under superatmospheric pressure, hydrogen and nitric oxide are fed separately into the reaction mixture, and the supported platinum catalyst used contains less than 10% by weight of particles having a size of less than 10μ.

4,457,907
COMPOSITION AND METHOD FOR PROTECTING A THERAPEUTIC DRUG

Garry L. Porter, Wichita, Kans., assignor to Clear Lake Development Group, Wichita, Kans.

Filed Aug. 5, 1982, Ser. No. 405,510

Int. Cl.³ A61K *9/30, 31/00, 9/22*

U.S. Cl. 424—7.1 **56 Claims**

1. A therapeutic composition available for therapeutic action in the postgastric portion of the gastrointestinal tract of an animal or a human, wherein premature release of the composition in the pre-intestinal phases of the gastrointestinal tract can result in alteration of the composition or in undesirable effects on the pre-intestinal phases by the composition, comprising

(a) a therapeutic drug that can cause undesirable effects on the pre-intestinal phases when contacting these phases; and

(b) an enteric coating surrounding the therapeutic drug, said enteric coating is a polypeptide that is resistant to degradation in the gastric environment, and said coating has a thickness of from about 0.01 to about 1.0 mm, said polypeptide is selected from the group consisting of polyarginine, polylysine, or a mixture of polyarginine and polylysine.

4,457,908

STABILIZATION OF CARRAGEENAN-CONTAINING TOOTHPASTE

George V. Scott, Scotch Plains, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 087,651, Oct. 24, 1979, Pat. No. 4,353,890. This application Aug. 6, 1982, Ser. No. 406,609
The portion of the term of this patent subsequent to Oct. 12, 1999, has been disclaimed.
Int. Cl.[3] A61K *7/16*
U.S. Cl. 424—49 14 Claims

1. A process for making a viscous dentifrice containing carrageenan which comprises directing microwave radiation onto such a dentifrice, while flowing it through an enclosed microwave-transparent walled conduit which is monitored and controlled with temperature sensing and flow sensing monitoring and control devices, in such quantity as to raise the temperature thereof to at least the gel-sol transition temperature of the carrageenan, and quiescently cooling the dentifrice to room temperature from the gel-sol transition temperature, with said microwave radiation being turned off when the dentifrice is not flowing through the conduit.

4,457,909

ORAL RINSE FORMULATION AND METHOD OF TREATING MOUTH AND THROAT IRRITATIONS THEREWITH

Tamés, 509 Matador La., Charlotte, N.C. 28209

Filed Sep. 27, 1982, Ser. No. 424,188
Int. Cl.[3] A61K *7/24, 33/14, 31/375*
U.S. Cl. 424—55 18 Claims

1. A soluble solid mouthwash formulation adapted to be dissolved in water for use as an oral bathing and cleansing rinse by gargling, mouthwashing, oral irrigation and the like for the prevention and treatment of sore throat and mouth and throat ulcers and like irritations, for the control of dental plaque and for other routine oral hygenic uses, said formulation consisting essentially of a powdered homogeneous mixture of at least one water soluble inorganic salt selected from the group consisting of sodium chloride and potassium chloride in a total concentration in the range of approximately 90% to 92% by weight, and ascorbic acid in a concentration in the range of approximately 8% to 10% by weight.

4,457,910

ANHYDROUS MULTI-PURPOSE MOISTURIZING COMPOSITION

Jon S. Van Cleave, West Des Moines, Iowa, assignor to Zarley, McKee, Thomte, Voorhees & Sease, Des Moines, Iowa

Division of Ser. No. 934,097, Aug. 16, 1978, Pat. No. 4,335,104. This application Aug. 17, 1979, Ser. No. 67,625
Int. Cl.[3] A61K *7/42, 7/32, 31/56, 47/00*
U.S. Cl. 424—59 10 Claims

1. A method of enhancing a topically administered physiologically active agent's activity by prolonging its contact with skin even in the presence of water, and which further enhances the moisturizing capability and cosmetic elegance of a liquid composition containing said physiologically active agent, said method comprising:

administering to the skin a non-water containing liquid composition comprising a small but effective amount of a physiologically active agent in a liquid base of said agent, said liquid base comprising at least a 20% portion of the composition and being a water insoluble non-ionic liquid surfactant or blend of surfactants, the molecules of which have a hydrophilic portion and a lipophilic portion and a hydrophilic-lipophilic balance of 12 or less.

4,457,911

DIALKYL MALONATES AS ORGANIC SUNSCREEN ADJUVANTS

Donald E. Conner, Clifton, and Boris M. Campelik, Hillsdale, both of N.J., assignors to Van Dyk & Company Inc., Belleville, N.J.

Continuation-in-part of Ser. No. 229,383, Jan. 28, 1981, abandoned. This application Aug. 3, 1982, Ser. No. 404,964
Int. Cl.[3] A61K *7/42, 7/44*
U.S. Cl. 424—59 9 Claims

1. A composition adapted for application to the human skin comprising a cosmetic oil carrier containing distributed therein an effective amount to provide substantial protection against erythemal and tanning radiation of an organic sunscreen selected from the group consisting of 2-ethylhexyl para methoxy cinnamate, homomenthyl salicylate, p-amino-benzoic acid and its esters, p-dimethyl amino benzoates, hydroxy and dihydroxy-4-methoxy benzophenones, and a benzalphthalide, and as an adjuvant therefor a dialkyl malonate selected from the group consisting of p-methoxy benzal diethyl malonate, p-methoxy benzal diisobutyl malonate, cinnamal diethyl malonate, indolal diethyl malonate, fural diethyl malonate, and 3,4,5 trimethoxy benzal diethyl malonate.

4,457,912

ELECTRIC RAZOR PRESHAVE COMPOSITION

Nicholas F. Scodari, P.O. Box 294, R.D. #1, Basking Ridge, N.J. 07920

Filed Aug. 24, 1982, Ser. No. 410,960
Int. Cl.[3] A61K *7/15, 7/09, 7/11*
U.S. Cl. 424—73 5 Claims

1. In a method for shaving hair with an electric razor after applying a preshave composition to the hair, the improvement wherein the preshave composition, which is applied, comprises:

a lower alkyl alcohol as a vehicle; and

an effective amount of a quaternary ammonium cationic polymer which can cling to each individual hair to be shaven when the preshave composition is applied to the hair and which can form a relatively stiff but pliable coating on each hair when the preshave composition subsequently dries on each hair.

4,457,913

COMPLETE ANTIGEN DRUG AND A PROCESS FOR PRODUCING IT FOR NONSPECIFIC ALLERGIC DISEASE THERAPY

Tadao Kokubu, 2-3, Ooi 2-chome, Shinagawa-ku, Tokyo, Japan

Filed Feb. 19, 1982, Ser. No. 350,550
Claims priority, application Japan, Mar. 4, 1981, 56-29941
Int. Cl.[3] A61K *37/02, 39/00*
U.S. Cl. 424—88 3 Claims

1. An antigen drug for therapy of nonspecific allergic diseases comprising a protein polysaccharide free from any adjuvants as its effective ingredient, said polysaccharide being obtained by a process comprising collecting normal human urine from healthy persons, preferably men, of age 10–35, testing said urine in accordance with the sulfosalicylic acid method to prove that it is protein negative, dialyzing the protein negative urine with water in a sterile tube, adding sodium hydroxide solution having pH 9–10 to the dialyzed urine to which calcium chlride anhydride is also added and stirred so as to cause a white precipitate to form, allowing particles of said precipitate to absorb the protein polysaccharide in the urine, separating the supernatant fluid as soon as possible, refining the white precipitate by centrifugal washing with water, repeating this washing a plurality of times, and triturating the resulting calcium protein polysaccharide compound after sterile drying thereof.

4,457,914

FECUNDITY OF DOMESTIC LIVESTOCK

Ronald I. Cox, Beecroft; Ronald M. Hoskinson, Normanhurst; Rex J. Scaramuzzi, Thornleigh; Patricia A. Wilson, Beacon Hill, and John M. George, Armidale, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

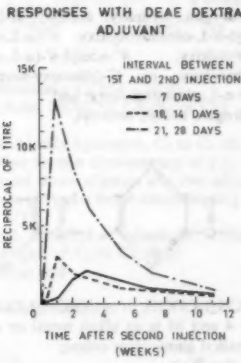
Continuation of Ser. No. 226,990, Jan. 21, 1981, Pat. No. 4,331,657. This application May 20, 1982, Ser. No. 380,325

Claims priority, application Australia, Feb. 6, 1980, PE2274

The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.³ A01N *45/00*; A61K *39/00*

U.S. Cl. 424—88 16 Claims



1. A method for increasing the fecundity of a flock of sheep or goats, comprising immunizing the females in the flock against a steroidal androgen or a steroidal oestrogen other than oestradiol-17β prior to the start of a mating period lasting at least twice the length of the average oestrous cycle for animals in the flock, whereby steroid-binding antibodies capable of binding said steroidal androgen or oestrogen are produced in said females; and maintaining, in said females during said mating period, a level of steroid-binding antibodies sufficient to produce an increase in the fecundity of the flock.

4,457,915

BABESIOSIS VACCINE PREPARED FROM SOLUBLE PARASITIC ANTIGEN FACTORS ISOLATED FROM DISINTEGRATION OF BABESIA INFECTED ERYTHROCITES

Brian V. Goodger, Pine Trees Mt. Glorious Rd., Mt. Nebo, Brisbane, Queensland; David F. Mahoney, 218 Stanley Ter., Taringa, Brisbane, Queensland, and Ian G. Wright, 72 Dewar Ter., Sherwood, Brisbane, Queensland, all of Australia

Continuation-in-part of Ser. No. 201,626, Oct. 28, 1980, abandoned. This application Oct. 15, 1982, Ser. No. 434,539

Claims priority, application Australia, Nov. 6, 1979, PE1217; Aug. 8, 1980, PE4950

Int. Cl.³ A61K *39/018*

U.S. Cl. 424—88 42 Claims

1. A method of preparation of a babesiosis vaccine, including the steps of:

(i) disintegrating a suspension of *Babesia bovis* infected erythrocytes;

(ii) separating the soluble and insoluble fractions contained in the disintegrated erythrocyte suspension; (iii) removing fibrinogen and contaminated babesial antigen from the soluble fraction of the disintegrated erythrocyte suspension; and

(iv) combining the soluble fraction after step

(iii) with an adjuvant to form the babesiosis vaccine.

4,457,916

METHOD FOR STABILIZING TUMOR NECROSIS FACTOR AND A STABLE AQUEOUS SOLUTION OR POWDER CONTAINING THE SAME

Hiroshi Hayashi, Fuji, and Masanobu Komiya, Nagaokakyo, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha and Dainippon Pharmaceutical Co., Ltd., both of Osaka, Japan

Filed Aug. 19, 1983, Ser. No. 524,540

Claims priority, application Japan, Aug. 31, 1982, 57-149890; Sep. 28, 1982, 57-172178

Int. Cl.³ A61K *35/16*, *35/12*

U.S. Cl. 424—101 76 Claims

1. A method for stabilizing Tumor Necrosis Factor, which comprises adding to an aqueous solution or powder containing Tumor Necrosis Factor an effective amount of a stabilizing agent selected from a nonionic surfactant, at least one substance selected from the group consisting of D-glucose, D-galactose, D-xylose, D-glucuronic acid, a salt of D-glucuronic acid, trehalose, a dextran and a hydroxyethyl starch, and mixtures thereof.

4,457,917

PEPTIDE, PROCESS FOR ITS PREPARATION AND PHARMACEUTICAL COMPOSITION CONTAINING SAME

Hildegard C. Schaller née Kornmayer, Heidelberg, and Heinz Bodenmüller, Ludwigshafen, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.v., Gottingen, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,554

Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117934

Int. Cl.³ A61K *37/02*; C07C *103/52*

U.S. Cl. 424—177 2 Claims

1. pGlu-Pro-Pro-Gly-Gly-Ser-Lys-Val-Ile-Leu-Phe.

4,457,918

GLYCOSIDES OF VITAMINS A, E AND K

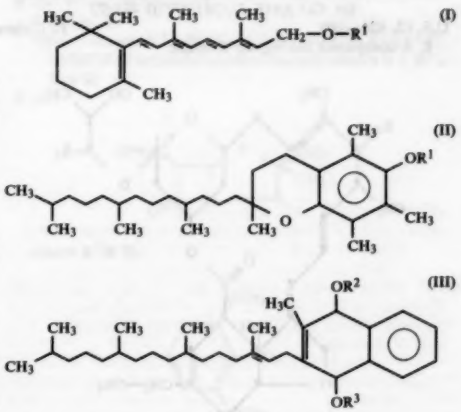
Michael F. Holick, and Sally A. Holick, both of Sudbury, Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed May 12, 1982, Ser. No. 377,446

Int. Cl.³ A61K *31/70*; C07H *15/00*, *15/18*

U.S. Cl. 424—180 25 Claims

1. A water soluble vitamin compound of the formula selected from the group consisting of:



wherein R^1 is a straight or branched chain glycosidic residue containing 1–20 glycosidic units per residue, and R^2 and R^3 are

hydrogen or R^1, with the proviso that at least one of said R^2 or R^3 is R^1.

16. A method of treating vitamin A hypovitaminosis in a mammal having endogenous glycosidase enzymes which comprises administering to said mammal a compound according to formula (I) of claim 1, in an amount sufficient to reverse said hypovitaminosis.

4,457,919

METHOD OF IMPARTING IMMUNOMODULATING, ANTIVIRAL OR ANTITUMOR ACTIVITY

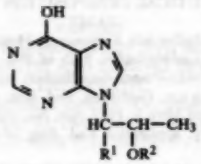
Lionel N. Simon, Santa Ana, Calif.; Alfredo Giner-Sorolla, Riverside, Conn., and Alvin Guttag, Bethesda, Md., assignors to Newport Pharmaceutical International, Inc., Newport Beach, Calif. and Sloan-Kettering Institute, New York, N.Y.

Division of Ser. No. 130,334, Mar. 14, 1980, Pat. No. 4,340,726. This application May 17, 1982, Ser. No. 379,066

Int. Cl.³ A61K *31/52;* **C07D** *473/30*

U.S. Cl. 424—180 **6 Claims**

1. A method of imparting immunomodulating activity, antiviral activity or antitumor activity comprising adminstering to a mannal an effective amount for such purpose of a compound of the formula:



wherein R^1 is an n-hexyl group and R^2 is the ester group of formic acid, acetic acid, propionic acid or butyric acid, phenylalkanoic acid having 2 to 3 carbon atoms in the alkonic acid portions, salicyclic acid, a hemi ester of an alkaneodioic or alkenedioic acid, phosphoric acid, nitric acid, or a glycoside of a sugar having 5 to 6 atoms.

4,457,920

4A-SUBSTITUTED AVERMECTIN COMPOUNDS

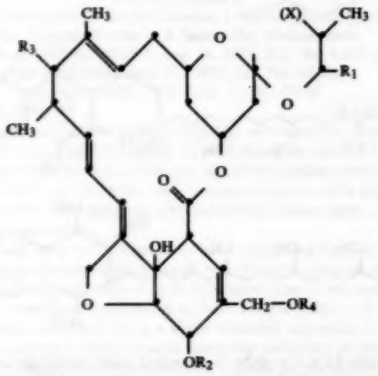
Helmut H. Mrozik, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 298,861, Sep. 3, 1981, abandoned. This application Aug. 4, 1982, Ser. No. 404,960

Int. Cl.³ A61K *31/365;* **C07D** *493/22*

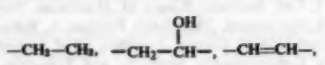
U.S. Cl. 424—180 **11 Claims**

1. A compound having the formula:



wherein

x is



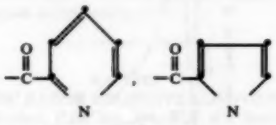
or

R_1 is methyl, ethyl, isopropyl or sec-butyl;

R_2 is hydrogen, methyl, acetyl, phenoxyacetyl or tert-butyl dimethylsilyl;

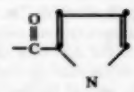
R_3 is hydrogen, hydroxy, acetoxy, α-L-oleandrosyloxy, 4'-acetyl-α-L-oleandrosyloxy, 4'-(α-L-oleandrosyl)-α-L-oleandrosyloxy, 4"-acetyl-4'-(α-L-oleandrosyl)-α-L-oleandrosyloxy, or 4"-(phenoxy-acetyl)-4'-(α-L-oleandrosyl)-α-L-oleandrosyloxy; and

R_4 is hydrogen, acetyl, benzoyl,



$—CO(CH_2)_nCOOH$, or $—CO(CH_2)_nCOOM$, wherein n is 2, 3 or 4 and M is an alkali metal or an ammonium or diloweralkyl ammonium cation;

provided that R_4 is



only when R_1 is isopropyl or sec-butyl.

4,457,921

METHOD OF REDUCING DENTAL CARIES

John J. Stroz, Monroe, Conn., and Donald A. M. Mackay, Pleasantville, N.Y., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation of Ser. No. 248,087, Mar. 27, 1981. This application May 9, 1983, Ser. No. 492,990

Int. Cl.³ A61K *7/16, 31/70*

U.S. Cl. 424—180 **8 Claims**

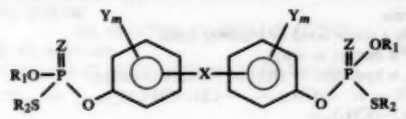
1. In a method of essentially blocking cell division and thereby inhibiting the growth of *Streptococcus mutans* having near optimum growth occurring in an environment of 0.4 to 0.5% of sucrose, with a slight increase in said growth resulting with an increase of the sucrose concentration to up to 2.0%, the improvement comprising, at a sucrose concentration of 0.4% or more, reducing the level of extracellular polysaccharide production from said sucrose by said *Streptococcus mutans* with a synergistic amount, in the range of from about 0.25:1.0 to about 4.0:1.0 of a sucrose to sugar substitute ratio at a final carbohydrate concentration of up to 2.0%, of hydrogenated starch hydrolysate non-metabolizing carbohydrate sugar substitute which thereby inhibits or prevents the growth of EPS production from said sucrose by said *Streptococcus mutans* to an extent greater than that achieved merely by replacement of said sucrose by non-metabolized carbohydrate.

4,457,922
PESTICIDAL BISPHENOL PHOSPHATES

Charles A. Wilson, II, Raleigh, N.C., assignor to Union Carbide Corporation, Danbury, Conn.

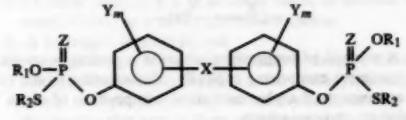
Filed Mar. 31, 1982, Ser. No. 363,832
Int. Cl.³ A01N 57/14; C07F 9/165
U.S. Cl. 424—206 **15 Claims**

1. A method of controlling insects and mites which comprises subjecting them to an insecticidally or miticidally effective amount of a compound of the formula:



wherein:
R_1 and R_2 are individually C_1 to C_6 alkyl;
X is C_2 to C_8 alkylene, $S(O)_n$, O, CR_3R_4 or CQ;
n is 0, 1 or 2;
R_3 and R_4 are individually hydrogen, C_1 to C_6 alkyl, C_1 to C_6 alkoxy or together form a divalent ring of 2 to 6 carbon or carbon and oxygen atoms wherein any two adjacent carbon atoms can also be part of a fused aromatic ring system;
Q is O, NOR_5 or CY_2;
R_5 is C_1 to C_6 alkyl, arylalkyl or substituted arylalkyl;
Y is hydrogen, halogen or C_1 to C_6 alkyl;
Z is oxygen or sulfur; and
m is 1 or 2.

6. Compounds of the formula:



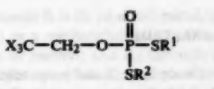
wherein:
R_1 and R_2 are individually C_1 to C_6 alkyl;
X is C_2 to C_8 alkylene, $S(O)_n$, O, CR_3R_4 or CQ;
n is 0, 1 and 2;
R_3 and R_4 are individually hydrogen, C_1 to C_6 alkyl, C_1 to C_6 alkoxy or together form a divalent ring of 3 to 7 carbon or carbon and oxygen atoms wherein any two adjacent carbon atoms can also be part of a fused aromatic ring system;
Q is O, NOR_5 or CY_2;
R_5 is C_1 to C_6 alkyl, arylalkyl or substituted arylalkyl;
Y is hydrogen, halogen or C_1 to C_6 alkyl;
Z is oxygen or sulfur; and
n is 1 or 2.

4,457,923
O-TRIHALOETHYL PHOSPHORODITHIOATE PESTICIDES

Mohamed A. H. Fahmy, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Mar. 31, 1982, Ser. No. 364,130
Int. Cl.³ A01N 57/12; C07F 9/165
U.S. Cl. 424—224 **9 Claims**

1. A compound of the formula



in which X is chlorine, bromine, or fluorine, R^1 and R^2 are each independently selected from alkyl of 1 to 6 carbon atoms, straight or branched chain.

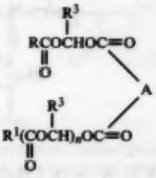
8. A method for controlling insects which comprises applying to the insect, to plants to which insects are attracted or upon which insects feed, or to soil in which such plants are planted an insecticidal amount of the compound of claim 1, 2, 3, 4, 5, or 6.

4,457,924
1,1-ALKANEDIOL DICARBOXYLATE LINKED ANTIBACTERIAL AGENTS

Vytautas J. Jasys, New London, and Michael S. Kellogg, Waterford, both of Conn., assignors to Pfizer, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 334,022, Dec. 22, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,915
Int. Cl.³ A61K 31/655, 31/43; C07D 499/32, 263/00
U.S. Cl. 424—226 **52 Claims**

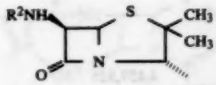
1. A compound of the formula



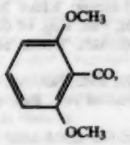
or a pharmaceutically acceptable cationic or acid addition salt thereof, wherein

A is $(C_1$–$C_{12})$alkylene, $(C_1$–$C_{12})$alkylidene, $(C_3$–$C_7)$cycloalkylene, phenylene, naphthalene,

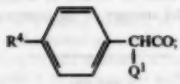
said alkylene or alkylidene substituted by phenyl or carboxy;
R^3 is H or $(C_1$–$C_3)$alkyl,
n is zero or 1,
R and R^1 are different and
R is P or B,
when n is zero, R^1 is H, $(C_1$–$C_4)$alkyl, benzyl, $CH(R^3)Cl$, $CH(R^3)I$ or tetrabutylammonium, and when n is 1, R^1 is P or B;
P is



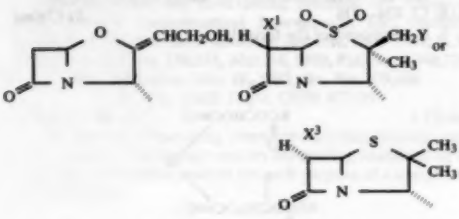
where R^2 is H,



$C_6H_5OCH_2CO$ or



Q^1 is H, NH_2, N_3, benzyloxycarbonylamino, 4-nitrobenzyloxycarbonylamino or 1-methyl-2-methoxycarbonylvinylamino; R^4 is H, OH, $(C_2–C_7)$alkanoyloxy, $(C_2–C_7)$alkoxycarbonyloxy or $R^5C_6H_4COO$, and R^5 is H, $(C_1–C_4)$alkyl, $(C_1–C_4)$alkoxy, F, Cl, Br or CN; and B is

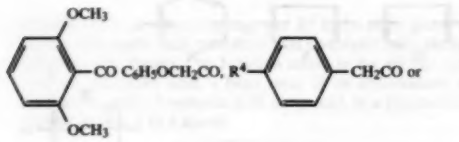


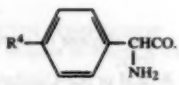
where, when Y is H, X^1 is H, CH_2OH or $CH(R^8)NH_2$ where R^8 is H or CH_3;

when Y is CL or CH_3COO, X^1 is H;

and X^3 is Cl, Br or I.

2. A compound according to claim **1** wherein when n is zero, R^1 is $(C_1–C_4)$alkyl, H or a sodium or potassium salt thereof, and when n is 1, R is B and R^1 is P where R^2 is H,





45. A pharmaceutical composition suitable for treating a bacterial infection in a mammalian subject, which comprises an antibacterially effective amount of a compound according to claim **2** and a pharmaceutically acceptable carrier.

4,457,925

ANDROSTANE DERIVATIVES, PROCESS FOR THEIR PRODUCTION, AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM

Dieter Bittler; Henry Laurent; Klaus Nickisch, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

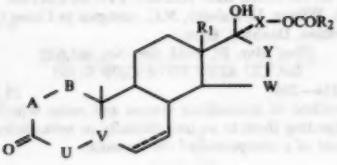
Filed Jul. 29, 1982, Ser. No. 403,279

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1981, 3130644

Int. Cl.³ C07J *1/00*

U.S. Cl. 424—243 **44 Claims**

1. An androstane of the formula



wherein

—is a single bond or a double bond,

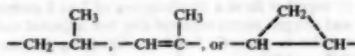
R_1 is methyl or ethyl,

R_2 is hydrogen or alkyl of 1–8 carbon atoms,

—X— is $—(CH_2)_n—$, $—CH=CH(CH_2)_m—$, or $—C\equiv C—(CH_2)_m—$

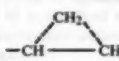
wherein n is an integer of 2 to 6 and m is an integer of 1 to 4,

—A—B— is $—CH_2—CH_2—$, $—CH=CH—$, $—CCl=CH—$,



—U—V< is $—CH_2—CH<$, $—C(OH)=C<$, or $—CCl=C<$, and

—W—Y— is $—CH_2—CH_2—$, $—CH_2—C(CH_3)_2—$, or



40. A method of suppressing sebum in a patient in need of such treatment comprising topically administering to the patient an amount of a pharmaceutical composition of claim **1** effective to suppress sebum.

4,457,926

CIS-PLATINUM(II) AMINE ASCORBATE COMPLEXES

Alan R. Amundsen, Somerville, and Eric W. Stern, Mountainside, both of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation-in-part of Ser. No. 237,221, Feb. 23, 1981, abandoned, and a continuation-in-part of Ser. No. 196,811, Oct. 14, 1980, abandoned, which is a division of Ser. No. 050,843, Jun. 20, 1979, abandoned. This application Dec. 18, 1981, Ser. No. 332,111

Int. Cl.³ A61K *31/55*; C07D *307/32*

U.S. Cl. 424—245 **22 Claims**

1. A cis-diamineplatinum(II) ascorbate compound of the formula:

$$cis\text{-}[Pt(II)A_2(X)_m(OH)_n]$$

wherein Pt is in valence state II and is coordinated to A in a cis configuration; A is ammonia or a monodentate alkylamine ligand; A_2 is a bidentate diamine ligand; X is the ascorbate moiety; m is a number having a value of from 1 to 2; n is a number having a value of from 0 to 1, and the sum of m+n is not greater than 2.

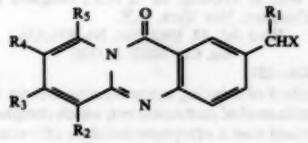
4,457,927

PYRIDO[2,1-B]QUINAZOLINONE DERIVATIVES AND THE PREPARATION AND USE THEREOF

Helmut Biere; Joachim-Friedrich Kapp, and Irmgard Böttcher, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 316,577, Oct. 30, 1981, abandoned, which is a continuation of Ser. No. 86,103, Oct. 18, 1979, abandoned. This application Dec. 22, 1982, Ser. No. 452,009
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845766
Int. Cl.³ C07D 471/04; A61K 31/505
U.S. Cl. 424—245 12 Claims

1. A pyrido[2,1-b]quinazolinone of the formula



wherein

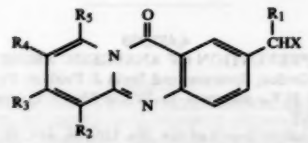
X is COOR wherein R is H, an alkali metal, an alkaline earth metal, Cu(II) or a methylglucamine cation;

R_1 is hydrogen or methyl; and

R_2 through R_5 are independently each hydrogen, trifluoromethyl, thiocyano, methylthio, methylsulfinyl, methylsulfonyl, methylsulfonimidoyl or methylsulfonamido, with the proviso that two or three of the groups R_2 through R_5 are hydrogen;

or a salt thereof with a physiologically acceptable acid.

2. A method of achieving an anti-inflammatory effect in a mammal which comprises administering to the mammal an anti-inflammatorily effective amount of a composition comprising an anti-inflammatorily effective amount of a compound of the following formula and a pharmaceutically acceptable carrier,



X is COOR wherein R is H, an alkali metal, an alkaline earth metal, Cu(II) or a methylglucamine cation;

R_1 is hydrogen or methyl; and R_2 through R_5 are independently each hydrogen, halogen, alkyl of 1–4 carbon atoms, trifluoromethyl, thiocyano, methylthio, methylsulfinyl, methylsulfonyl, methylsulfonimidoyl or methylsulfonamido, with the proviso that two or three of the groups R_2 through R_5 are hydrogen; or a salt thereof with a physiologically acceptable acid.

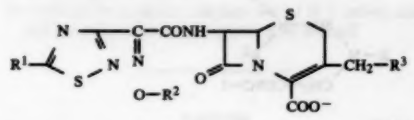
4,457,928

CEPHEM COMPOUNDS

Tsutomu Teraji, Osaka; Kazuo Sakane, Amagasaki, and Jiro Goto, Suita, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 294,291, Aug. 19, 1981, which is a continuation-in-part of Ser. No. 270,029, Jun. 3, 1981, Pat. No. 4,431,642. This application Dec. 14, 1981, Ser. No. 330,465
Claims priority, application United Kingdom, Dec. 1, 1980, 8038456; Dec. 31, 1980, 8041636; Apr. 9, 1981, 8111164
The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.
Int. Cl.³ A61K 31/545; C07D 501/46
U.S. Cl. 424—246 27 Claims

1. Cephem compounds of the formula:



wherein

R^1 is amino or a protected amino group;

R^2 is lower alkyl, lower alkenyl, lower alkynyl or cyclo (lower) alkenyl; and

R^3 is a pyridino group substituted with 1 to 2 substituent(s) selected from the group consisting of halogen, amino, acylamino, lower alkyl, hydroxy (lower) alkyl and protected amino (lower) alkyl.

3. A pharmaceutical antibacterial composition comprising an antimicrobially effective amount of a compound of claim 1 in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

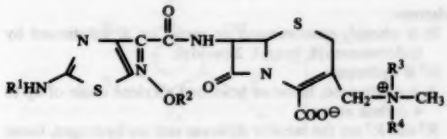
4,457,929

3-QUATERNARY AMMONIUM METHYL-SUBSTITUTED CEPHALOSPORIN DERIVATIVES

Hajime Kamachi, Urayasu; Jun Okumura, Yokohama, and Takayuki Naito, Kawasaki, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Mar. 29, 1982, Ser. No. 363,313
Int. Cl.³ A61K 31/545; C07D 501/46
U.S. Cl. 424—246 11 Claims

1. A compound of the formula



I

wherein R^1 is hydrogen or a conventional amino-protecting group, R^2 and R^3 each are independently methyl or ethyl, and R^4 is methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, allyl, 2-butenyl, 3-butenyl, 2-hydroxyethyl, 3-hydroxypropyl, 2-(dimethylamino)ethyl, pyridylmethyl, pyridylethyl, benzyl or phenethyl, or a nontoxic pharmaceutically acceptable acid addition salt or solvate thereof.

8. An antibacterial composition comprising an antibacterially effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

4,457,930
TODOPROPARGYLSULPHAMIDES, MICROBICIDAL COMPOSITIONS AND USE

Hans-Georg Schmitt, Leverkusen; Wilfried Paulus; Hermann Genth, both of Krefeld; Wilhelm Brandes, Leichlingen; Paul Reinecke, and Hans Scheinpflug, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

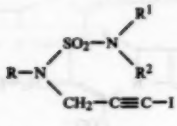
Filed Aug. 26, 1983, Ser. No. 526,930

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1982, 3234037

Int. Cl.[3] **A01N** *41/02, 43/84;* **C07D** *295/22;* **C07C** *161/00*

U.S. Cl. 424—248.5 **15 Claims**

1. A 3-iodopropargyl-sulphamide of the formula



in which

R represents hydrogen, alkyl, optionally substituted cycloalkyl, optionally substituted phenylalkyl, optionally substituted heterocyclylalkyl or optionally substituted phenyl, and

R^1 and R^2 are identical or different and represent alkyl, or

R^1 and R^2 represent an alkylene bridge which, together with the nitrogen atom at which they are located, form a ring which can be interrupted by further hetero atoms.

13. A microbicidal composition comprising a microbicidally effective amount of a compound according to claim **1** in admixture with a diluent.

4,457,931
PIPERAZINE DERIVATIVES WITH ANTICHOLINERGIC AND/OR ANTIHISTAMINIC ACTIVITY

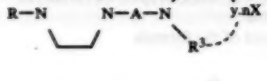
Carlo Milani; Giovanni M. Carminati, and Attilio Sovera, all of Milan, Italy, assignors to Selvi & C. S.p.A., Milan, Italy

Filed Sep. 27, 1982, Ser. No. 424,512

Int. Cl.[3] **A61K** *31/495;* **C07D** *401/00, 413/00*

U.S. Cl. 424—250 **18 Claims**

1. A compound of formula I



(I)

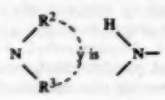
wherein:

R is phenyl, unsubstituted or mono or di substituted by trifluoromethyl; benzyl, 2-pyridyl;

R^1 is hydrogen;

A is a saturated, linear or branched alkylene chain of up to 4 carbon atoms;

R^2 and R^3 are the same or different and are hydrogen, linear or branched alkyl of 2–6 carbon atoms or the group



methylene dioxy phenyl when y is zero; or are an alkylene chain which together with the nitrogen atom to which they are connected and together with y form a 5-, 6- or 7-member ring which is a cyclic group having one N atom, adamantyl or cyclohexyl;

X is halogen or a pharmaceutically acceptable organic or inorganic anion;

n is 0; 1; 2; 3 or in the case of a bifunctional acid, n is equal to 0.5; 1.5; 2.5 and lower alkyl quaternary compounds and enantiomers and diestereoisomers thereof.

18. A pharmaceutical composition having anti-cholinergic activity, suitable for administration by the oral, rectal, parenteral route and by eye instillation, which contains as the active component a compound according to claim **1** or a pharmaceutically compatible salt thereof.

4,457,932
ANTI-ULCER AGENTS

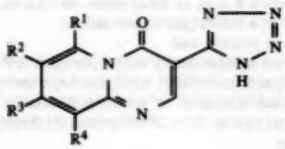
Peter F. Juby, Jamesville; Thomas W. Hudyma, and Douglas G. Colton, both of Manlius, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Jul. 22, 1983, Ser. No. 516,026

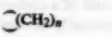
Int. Cl.[3] **A61K** *31/505*

U.S. Cl. 424—251 **20 Claims**

1. A method of inducing cytoprotective activity in a mammalian host in need of such treatment, which comprises administering to said host a cytoprotective dose of a compound of the formula



wherein R^1, R^2, R^3 and R^4 which may be the same or different are each hydrogen, halogen or (lower)alkyl, or wherein R^3 or R^4 when taken together are



in which n is 3, 4 or 5, or a pharmaceutically acceptable salt thereof, with the proviso that R^1, R^2, R^3 and R^4 may not all be hydrogen.

4,457,933
PREVENTION OF ANALGESIC ABUSE

Maxwell Gordon, Syracuse, and Irwin J. Pachter, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 114,786, Jan. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 962,868, Nov. 24, 1978, abandoned. This application Dec. 11, 1981, Ser. No. 329,839

Int. Cl.[3] **A01N** *43/42;* **A61K** *9/10, 9/20*

U.S. Cl. 424—260 **11 Claims**

1. A method for decreasing the potential for oral abuse of an analgesic dose of oxycodone orally administered to a human comprising orally administering an oxycodone-naloxone composition having a ratio of 2.5–5:1 parts by weight wherein said composition contains from 1 to 3 mg of naloxone.

4,457,934
INSECT REPELLENT COMPOUNDS

Rayman Y. Wong, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

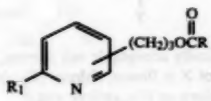
Continuation of Ser. No. 259,382, May 1, 1982, abandoned. This application Aug. 2, 1982, Ser. No. 404,245

The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.

Int. Cl.³ C07D *213/55;* A01N *43/40*

U.S. Cl. 424—263 27 Claims

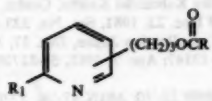
1. A compound having the formula



in which R is C_3–C_5 alkyl, C_3–C_5 alkenyl, or

R_1 is C_1–C_4 alkyl; R_2 is C_1–C_4 alkyl; and the side chain is substituted on the pyridine ring at the 2- or 3-position.

25. An insect repellent composition containing an amount of a compound having the formula



in which R is C_3–C_5 alkyl, C_3–C_5 alkenyl, or

R_1 is C_1–C_4 alkyl; R^2 is C_1–C_4 alkyl; and the side chain is substituted on the pyridine ring on the 2- or 3-position, effective to repel insects; and an inert diluent or carrier.

4,457,935
ANTIHYPERTENSIVE 4-THIAZOLIDINECARBOXYLIC ACIDS (SUBSTITUTED PHENYL DERIVATIVES)

Junichi Iwao, Takarazuka; Masayuki Oya, Osaka; Toshio Baba, Suita; Tadashi Iso, Tondabayashi, and Takehisa Chiba, Kyoto, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

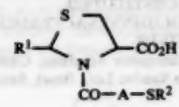
Division of Ser. No. 23,397, Mar. 23, 1979. This application Mar. 2, 1981, Ser. No. 239,599

Claims priority, application Japan, Apr. 8, 1978, 53-41632; Apr. 25, 1978, 53-49657; Jul. 3, 1978, 53-81116

Int. Cl.³ C07D *277/04;* A61K *31/425*

U.S. Cl. 424—270 32 Claims

1. A compound of the formula



(I)

wherein

R^1 is phenyl substituted by at least one substituent selected from the group consisting of lower alkylenedioxy, amino, lower alkylamino, lower alkanoylamino, benzoylamino, and benzyloxycarbonylamino, wherein the terms lower alkyl, lower alkanoyl and lower alkylene refer to groups having from 1 to 4 carbon atoms;

R^2 is hydrogen or benzoyl;

A is straight or branched alkylene with 1 to 3 carbon atoms; and pharmaceutically acceptable salts thereof.

4,457,936
USE OF HYDROXYPHENYL-THIAZOLE-, -THIAZOLINE- AND -THIAZOLIDINE-CARBOXYLIC ACIDS, FOR INFLUENCING THE COLLAGEN METABOLISM

Eberhard Draeger, Frankfurt am Main, and Henning Lübbers, Schwalbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

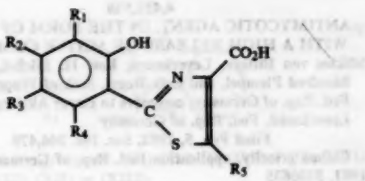
Continuation of Ser. No. 228,975, Jan. 27, 1981, abandoned. This application Apr. 7, 1982, Ser. No. 366,318

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1980, 3002989

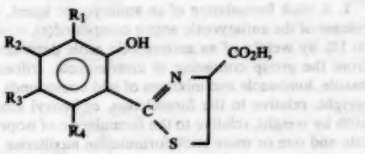
Int. Cl.³ A61K *31/425;* C07D *277/62*

U.S. Cl. 424—270 4 Claims

1. A pharmaceutical preparation for inhibiting collagen biosynthesis which comprises an effective inhibiting amount of a carboxylic acid selected from the group of acids having the formulas



and



or a soluble, physiologically acceptable carboxylate salt of such an acid, formed with a base, wherein R_1 and R_3 independently of each other are hydrogen, methyl, chlorine, or bromine, or one of R_1 or R_3 is hydrogen, methyl, chlorine, or bromine and the other is nitro, amino, or sulfonylamido;

R_2 is hydrogen, hydroxyl, or methyl;

R_4 is hydrogen or methyl, but not all of R_1–R_4 are hydrogen; and

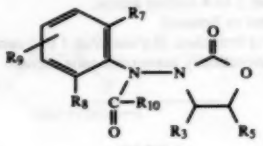
R_5 is hydrogen, methyl, phenyl, or carboxyl, together with a pharmaceutically acceptable carrier therefor.

4,457,937
FUNGICIDAL N-SUBSTITUTED PHENYL-N-(3-OXO-3-OXAZOLIDINYL)-ACETAMIDE DERIVATIVES

Rudolf Sandmeier, Riehen, and Hanspeter Schelling, Oberwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Aug. 15, 1980, Ser. No. 178,277
Claims priority, application United Kingdom, Aug. 16, 1979, 7928603
Int. Cl.³ C07D 263/08; A01N 43/76, 43/80
U.S. Cl. 424—272 22 Claims

1. A compound of the formula I:



wherein

R_7 and R_8 are independently C_1–C_3alkyl, fluoro, chloro, bromo or C_1–C_3alkoxy,

R_9 is hydrogen, C_1–C_3alkyl or fluoro, chloro or bromo,

R_{10} is C_1–C_4alkoxy-C_1–C_4alkyl, C_1–C_4alkylthio-C_1–C_4alkyl, 2-furyl, 2-tetrahydrofuryl, halogenated 2-furyl in which the halogen is fluoro, chloro, bromo or iodo, halogenated 2-tetrahydrofuryl in which the halogen is fluoro, chloro, bromo or iodo, 1-imidazolylmethyl, 1-pyrazolylmethyl, 2-tetrahydrofuryloxymethyl, 2-tetrahydropyranyloxymethyl or C_1–C_4 halogenalkyl in which the halogen is fluoro, chloro, bromo or iodo, and

R_3 and R_5 are independently hydrogen or C_1–C_3alkyl.

18. The method of combating phytopathogenic fungi in plants, seeds or soil, which comprises applying to the plants, seeds or soil a fungicidally effective amount of a compound claimed in any one of claims 1 or 2 to 17.

4,457,938
ANTIMYCOTIC AGENT, IN THE FORM OF STICKS, WITH A HIGH RELEASE OF ACTIVE COMPOUND

Miklos von Bittera, Leverkusen; Karl H. Büchel, Burscheid; Manfred Plempel, and Erik Regel, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 5, 1982, Ser. No. 346,479
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1981, 3106635
Int. Cl.³ A61K 31/415
U.S. Cl. 424—273 R 6 Claims

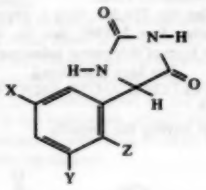
1. A stick formulation of an antimycotic agent, with higher release of the antimycotic active compound(s), containing 0.05 to 1% by weight of an antimycotic azole derivatives selected from the group consisting of clotrimazole, trifonazole, climbazole, lombazole and mixtures of said compounds, 3 to 5% by weight, relative to the formulation, of benzyl alcohol, 2.5 to 10% by weight, relative to the formulation of isopropyl myristate and one or more stick formulation auxiliaries.

4,457,939
ALDOSE REDUCTASE INHIBITING 5-(2-ALKOXY-3-SUBSTITUTED PHENYL)HYDANTOINS

Rodney C. Schnur, Noank, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Nov. 1, 1982, Ser. No. 438,200
Int. Cl.³ A61K 31/415
U.S. Cl. 424—273 R 8 Claims

1. A method for treating a diabetic host for diabetes-associated complications which comprises administering to said host an effective amount of a compound having the formula



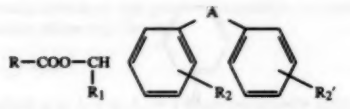
I or a pharmaceutically acceptable salt thereof,
wherein each of X is fluoro, chloro, (C_{1-4})alkyl or nitro;
Y is fluoro, chloro or (C_{1-4})alkyl; and
Z is (C_{1-4})alkoxy.

4,457,940
CARBOXYLIC ACID ESTER DERIVATIVES, PROCESS FOR MANUFACTURING SAID DERIVATIVES, INSECTICIDES AND ACARICIDES CONTAINING SAID DERIVATIVES, AND METHOD FOR KILLING INSECTS AND ACARINA BY TREATING THEREWITH

Yoshio Katsuda, Nishinomiya; Hajime Hirobe, and Yoshihiro Minamite, both of Toyonaka, all of Japan, assignors to Dainippon Jochugiku Kabushiki Kaisha, Osaka, Japan

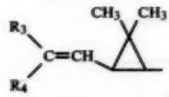
Filed Dec. 22, 1981, Ser. No. 333,451
Claims priority, application Japan, Dec. 27, 1980, 55-185758; Jan. 31, 1981, 56-13147; Apr. 7, 1981, 56-52729; Apr. 21, 1981, 56-60070
Int. Cl.³ C09B 23/10; A01N 43/36, 37/08, 37/10
U.S. Cl. 424—274 20 Claims

1. A compound of the formula (I):

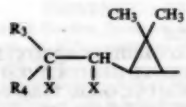


(I)

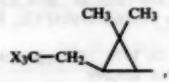
wherein R is the group (II), (III), (IV), (V), (VI), (VII), (VIII), (IX), (X), (XI), (XII) or (XIII):



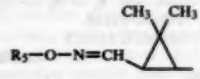
(II)



(III)



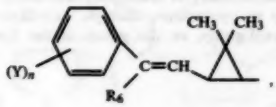
(IV)



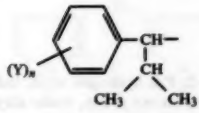
(V)

-continued

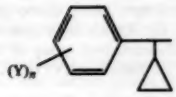
(VI)



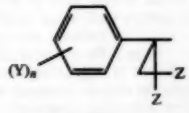
(VII)



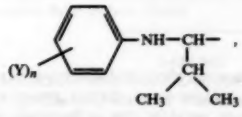
(VIII)



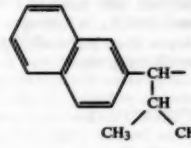
(IX)



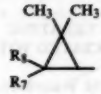
(X)



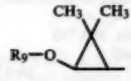
(XI)



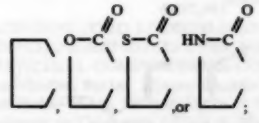
(XII)



(XIII)

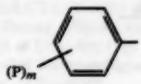


wherein R_3 and R_4, which are the same as or different from each other, are methyl group, halogen atom, or halomethyl group, or R_3 and R_4 together may form the ring:



X is halogen atom; R_5 is alkyl group having 1–3 carbon atoms; n is an integer of 1–3; R_6 is hydrogen atom, methyl group, halogen atom, or cyano group; Y is hydrogen atom, halogen atom, lower alkyl group, lower alkoxy group, lower alkylthio group, lower haloalkyl group, lower haloalkoxy group, lower haloalkylthio group, or methylenedioxy group; z is methyl group, fluorine atom, or chlorine atom; R_7 is methyl group or chlorine atom; R_8 is methyl group, chlorine atom, halomethyl group, methoxy group, or methoxymethyl group, of R_7 and R_8 together may form ethylene-trimethylene- or tetramethylene-chain; R_9 is alkyl group having 1–6 carbon atoms, or cycloalkyl-, alkenyl-, haloalkyl-, haloalkenyl- or alkynyl-group, or the group of the formula (XIV):

(XIV)



wherein m is an integer of 1–2; P is hydrogen atom, halogen atom, lower alkyl group, lower alkoxy group, lower alkylthio group, lower haloalkyl group, lower haloalkoxy group, or methylenedioxy group; R_1 is hydrogen atom, cyano group, methyl group or ethynyl group; R_2, R_2' are hydrogen atom, halogen atom, methyl group, trifluoromethyl group or lower alkoxy group; A is the group of the formula (XV) or (XVI):

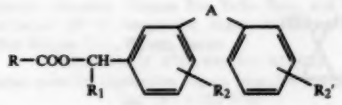
(XV)

(XVI)

wherein R_{10} is hydrogen atom, alkyl- or haloalkyl-group having 1–2 carbon atoms, halogen atom, formyl group, acetyl group or haloacetyl group, provided that in the group of the formula (XV) the nitrogen atom may form a salt of a strong inorganic acid or a strong organic acid; R_{11} is hydrogen atom or fluorine atom; and R_{12} is halogen atom, lower alkyl group, lower haloalkyl group or lower alkoxy group.

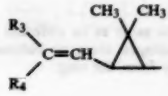
20. A method for killing insects or acarina by treating with insecticides or acaricides comprising as an essential ingredient an insecticidally or acaricidally effective amount of a compound of the formula (I):

(I)

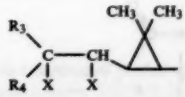


wherein R is the group (II), (III), (IV), (V), (VI), (VII), (VIII), (IX), (X), (XI), (XII) or (XIII):

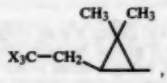
(II)



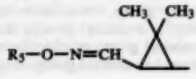
(III)



(IV)



(V)



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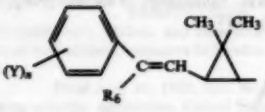
(VI)



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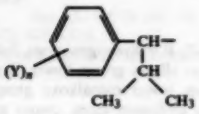
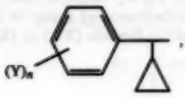


(VIII)



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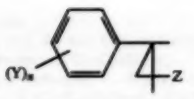
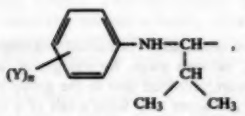
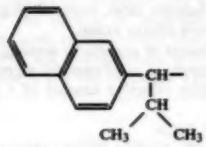


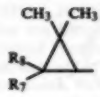
(X)



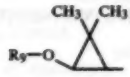
(XI)



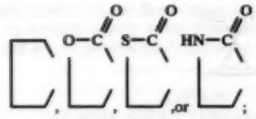
(XII)



(XIII)



wherein R_3 and R_4, which are the same as or different from each other, are methyl group, halogen atom or halomethyl group, or R_3 and R_4 together may form the ring:



X is halogen atom; R_5 is C_1–C_3 alkyl group; n is an integer of 1–3; R_6 is hydrogen atom, methyl group, halogen atom or cyano group; Y is hydrogen atom, halogen atom, lower alkyl group, lower alkoxy group, lower alkylthio group, lower haloalkyl group, lower haloalkoxy group, lower haloalkylthio group or methylenedioxy group; z is methyl group, fluorine atom or chlorine atom; R_7 is methyl group or chlorine atom; R_8 is methyl group, chlorine atom, halomethyl group, methoxy group or methoxymethyl group, or R_7 and R_8 together may form ethylene-, trimethylene-, or tetramethylene-chain; R_9 is C_1–C_6 alkyl group or cycloalkyl-, alkenyl-, haloalkyl-, haloalkenyl-, or alkynyl-group, or the group of the formula (XIV):

(XIV)

wherein m is an integer of 1–2; P is hydrogen atom, halogen atom, lower alkyl group, lower alkoxy group, lower alkylthio group, lower haloalkyl group, lower haloalkoxy group or methylenedioxy group; R_1 is hydrogen atom, cyano group, methyl group or ethynyl group; R_2, R_2' are hydrogen atom, halogen atom, methyl group, trifluoromethyl group or lower alkoxy group; A is the group of the formula (XV) or (XVI):

(XV)

(XVI)

wherein R_{10} is hydrogen atom, alkyl- or haloalkyl-group having 1–2 carbon atoms, halogen atom, formyl group, acetyl group or haloacetyl group, provided that in the group of the formula (XV) the nitrogen atom may form a salt of a strong inorganic acid or a strong organic acid; R_{11} is hydrogen atom or fluorine atom; and R_{12} is halogen atom, lower alkyl group, lower haloalkyl group or lower alkoxy group.

4,457,941

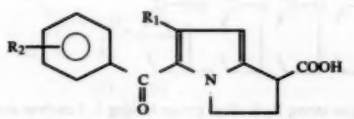
USE OF PYRROLO-PYRROLE IN TREATING MICROVASCULAR DISEASES ASSOCIATED WITH DIABETES

Howard J. Ringold, Woodside, and L. David Waterbury, San Mateo, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

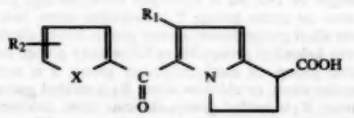
Filed Mar. 22, 1982, Ser. No. 360,753
Int. Cl.³ A61K *31/40*
U.S. Cl. 424—274 **10 Claims**

1. A method for inhibiting or relieving diabetic retinopathy, diabetic neuropathy and diabetic nephropathy in mammals which method comprises administering systemically to a mammal in need thereof a therapeutically effective amount of a compound of the formula:

(A)



(B)



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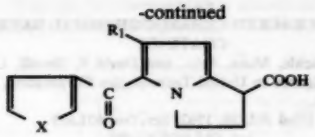
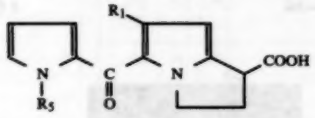


(C)



(D)

and the individual (l-) and (d-)acid isomers thereof and the pharmaceutically acceptable non-toxic esters and salts thereof, wherein

R_1 represents hydrogen; lower alkyl group having from one to four carbon atoms; chloro or bromo;

R_2 represents hydrogen, a lower alkyl group having from one to four carbon atoms, a lower alkoxy group having from one to four carbon atoms, chloro, bromo, fluoro; or $R_4S(O)n$ wherein

R_4 is lower alkyl and

n is the integer 0, 1 or 2;

X represents oxygen or sulphur; and

R_5 represents hydrogen or lower alkyl group having from one to four carbon atoms.

4,457,942

PROCESS FOR WASTE NITROGEN REMOVAL

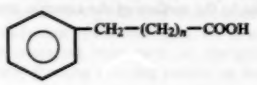
Saul W. Brusilow, Dept. of Pediatrics, The Johns Hopkins Hospital, Baltimore, Md. 21205

Filed Aug. 20, 1982, Ser. No. 410,018

Int. Cl.³ A61K *31/19*

U.S. Cl. 424—317 **10 Claims**

1. A process for controlling waste nitrogen accumulation disease in a patient suffering from such waste nitrogen accumulation disease caused by an impairment in the normal synthesis of urea from ordinary waste nitrogen in the body or in the normal excretion thereof, said process comprising administering to the patient an effective amount of at least one compound of the formula:



wherein n is 2, 4, 6 or 8, or a pharmaceutically, acceptable salt thereof, and wherein the amount of said compound administered to the patient is sufficient to produce enough phenylacetate to react with waste nitrogen to form an amino acylation product for urinary discharge of said product.

4,457,943

N-(2H-DIFLUORO-3,5-DICHLORO-PHENYL)-N'-(2,6-DIFLUOROBENZOYL) UREA DERIVATIVE AND PESTICIDAL COMPOSITIONS CONTAINING SAME

Heinz-Manfred Becher, Bingen; Ricarda Prokic-Immel, Mainz, and Walter Wirtz, Darmstadt, all of Fed. Rep. of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim, Fed. Rep. of Germany

Filed Nov. 16, 1981, Ser. No. 321,446

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1980, 3044055; Jun. 15, 1981, 3123720

Int. Cl.³ A01N *47/28, 47/30*; C07C *127/22*

U.S. Cl. 424—322 **3 Claims**

1. N-(2,4-Difluoro-3,5-dichlorophenyl)-N'-(2,6-difluorobenzoyl)-urea.

3. The method of killing insects or acarids which comprises contacting same with an effective insecticidal or acaridicidal amount of the compound of claim 1.

4,457,944

1,3-DIALKYL-CYCLOHEXANES, METHOD OF PRODUCTION AND METHOD OF USE IN COSMETICS

Jens Conrad, Hilden; Ulf-Armin Schaper, and Ulrich Zeidler, both of Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

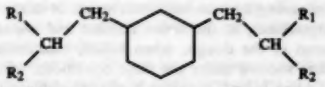
Filed Dec. 21, 1981, Ser. No. 332,950

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1981, 3133078

Int. Cl.³ A61K *7/06, 47/00*

U.S. Cl. 424—358 **4 Claims**

1. In a cosmetic preparation selected from the group consisting of suspensions, gels, emulsions, ointments and pastes comprising cosmetic adjuvants selected from the group consisting of water, preservatives, sequestering agents, perfumes, solvents, opacifiers, thickeners, dyes, pH-modifying additives, plant extracts, and skin care ingredients selected from the group consisting of collagens, fatty acids, fatty acid esters, glycols, glycol ethers, animal oils, plant oils and synthetic oils, wherein the improvement comprises, as a refatting cosmetic oil, from 2% to 25% by weight of at least one 1,3-dialkyl-cyclohexane of the formula



wherein R_1 is a member selected from the group consisting of hydrogen and a straight chained or branched C_1–C_{20}-alkyl and R_2 is a straight chained or branched C_1–C_{20}-alkyl.

4,457,945

MUSHROOM GROWING BY UTILIZING SEWAGE SLUDGE COMPOST AND RE-UTILIZATION OF THE USED COMPOST AS LIVESTOCK FEED

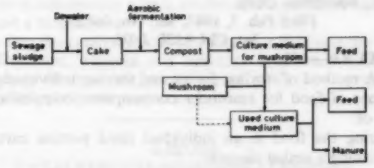
Yoshinobu Imamura; Hajime Ito; Yoko Sato, and Hiromichi Nakamori, all of Amagasaki, Japan, assignors to Hitachi Kiden Kogyo, Ltd., Hyogo, Japan

Filed Sep. 22, 1982, Ser. No. 421,582

Claims priority, application Japan, Mar. 15, 1982, 57-41510

Int. Cl.³ A23B *7/10*

U.S. Cl. 426—53 **2 Claims**



1. In a method of producing livestock feed from a material containing lignin, cellulose, hemicellulose and pentosan by the decomposing action of mushrooms, the improvement wherein the material is a compost produced from a composition consisting essentially of a mixture of sewage sludge and an additive selected from the group consisting of rice hulls, sawdust and bark, wherein said compost is produced by (a) converting sewage sludge into dewatered cakes; (b) mixing the sewage sludge with an additive selected from the group consisting essentially of rice hulls, sawdust and bark; (c) subjecting the thus-produced mixture to aerobic fermentation to convert it

into compost; and (d) decomposing the lignin, cellulose, hemicellulose and pentosan in said compost with mushrooms capable of decomposing said lignin, cellulose, hemicellulose and pentosan so as to convert the compost to livestock feed high in nutritive value.

4,457,946

DOUGHS AND COOKIES PROVIDING STORAGE-STABLE TEXTURE VARIABILITY

Charles A. Hong, Deerfield Township, Portage County, and William J. Brabbs, Springfield Township, Clark County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 107,229, Dec. 26, 1979, abandoned, and Ser. No. 220,643, Dec. 29, 1980, abandoned, said Ser. No. 220,643, is a continuation-in-part of Ser. No. 107,229,. This application Mar. 3, 1981, Ser. No. 240,051

Int. Cl.³ A21D *13/08*

U.S. Cl. 426—94 48 Claims

1. A sweetened food product in the form of a cookie dough preform, comprising a matrix made from cookie ingredients, and being characterized in having distributed therein discrete regions of dough containing readily crystallizable sugar, comprising a mono- or di-saccharide or mixture thereof that readily and spontaneously crystallizes at the water content and water activity conditions encountered in the dough, when baked; and discrete regions of dough containing crystallization resistant sugar, comprising a mono- or di-saccharide or mixture thereof which crystallizes, at the water content and water activity encountered in the dough, when baked, substantially more slowly than sucrose under the same conditions, whereby the product, when baked, provides a storage-stable plurality of textures, the regions containing readily crystallizable sugar providing a crisp texture, and the regions containing crystallization resistant sugar providing a chewy texture, and further characterized in that the regions providing a crisp crumb and the regions providing a chewy crumb provide crumbs having a

$$[\log \max (\text{stiffness/plasticity}) - \log \min (\text{stiffness/plasticity})]$$

of at least about 1.75.

4,457,947

AUTOMATIC COOKING METHOD

Dieter Schmidt; Josef Buschor, both of Santa Clara, Calif., and Wayne K. Spillner, Benton, Wash., assignors to UI Group, Inc., Boardman, Oreg.

Filed Feb. 7, 1983, Ser. No. 464,207

Int. Cl.³ A23L *1/01*

U.S. Cl. 426—438 6 Claims

1. A method of storing, frying and serving individual-sized portions of food for consumer consumption, comprising the steps of:

storing the food in an individual sized portion cartridge having a sealed closure;

removing the cartridge from storage;

removing the sealed closure to access the food;

placing the opened cartridge into an automatic frying machine;

automatically dumping the food from the cartridge into a frying medium within the automatic frying machine;

frying the dumped food, separate from the cartridge, in the frying medium;

automatically dumping the fried food back into the opened cartridge; and

removing the cartridge with the fried food therein from the automatic frying machine so that the cartridge will serve as a serving container.

4,457,948

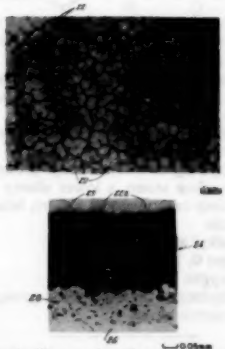
QUENCH-CRACKED CERAMIC THERMAL BARRIER COATINGS

Duane L. Ruckle, Mesa, Ariz., and David S. Duvall, Cobalt, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 26, 1982, Ser. No. 401,689

Int. Cl.³ B05D *1/08*

U.S. Cl. 427—34 6 Claims



1. The method of improving the resistance to thermal fatigue failure of a thin ceramic coating adhered to the surface of a metal substrate article, wherein the ceramic material has a lower coefficient of thermal expansion than the metal and wherein the failure is by spalling of the ceramic coating characterized by heating both the coating and substrate to an elevated first temperature; and then contacting the ceramic coating surface with a heat transfer medium at a second temperature lower than the first temperature, to quench the coating so that the coating contracts in unit dimension faster than the adjacent substrate, to cause a thermal stress in the coating which exceeds its ultimate tensile stress, to thereby create in the coating a multiplicity of cracks running from the coating surface to the surface of the metal article and create within the coating a multiplicity of cracks running from the surface of the metal substrate to the surface of the ceramic coating.

4,457,949

METHOD OF PRODUCING A PHOTOELECTRIC CONVERSION LAYER

Yukio Takasaki, Hachioji; Yasuharu Shimomoto, Nishitama; Yasuo Tanaka, Kokubunji; Akira Sasano, Nishitama, and Toshihisa Tsukada, Nerima, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 15, 1982, Ser. No. 388,619

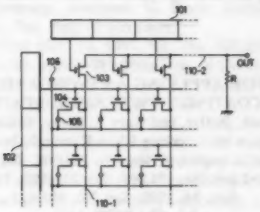
Claims priority, application Japan, Jun. 17, 1981, 56-92300

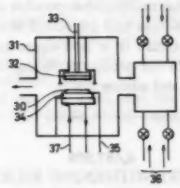
Int. Cl.³ B05D *3/14, 5/12*

U.S. Cl. 427—39 10 Claims

1. A method of producing a photoelectric conversion layer comprising the steps of forming a hydrogen-containing amorphous silicon layer on a predetermined substrate in a plasma atmosphere at a substrate temperature below 200° C., subse-

quently stopping the plasma and then immediately heat-treating said hydrogen-containing amorphous silicon layer at 200° C.–400° C. without the presence of a heat cycle in which the substrate is cooled.





4,457,950

PROCESS FOR PRODUCING WIRING CIRCUIT BOARD

Tsuyoshi Fujita, Yokohama; Shinichi Komatsu, Fujisawa, and Gyozo Toda, Hino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 24, 1983, Ser. No. 497,578
Claims priority, application Japan, May 28, 1982, 57-89861
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—43.1 **10 Claims**

1. A process for producing a wiring circuit board, which comprises providing an insulating layer comprising at least two insulating substances having different dissociation energies for metalization, including metal elements, on a substrate, and irradiating the insulating layer with an energizing beam by scanning, thereby forming a wiring pattern as desired.

4,457,951

ETCH SOLUTION AND METHOD

John F. D'Amico, Montgomery Township, Somerset County, and Michael A. DeAngelo, Jr., Ewing Township, Mercer County, both of N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Oct. 28, 1983, Ser. No. 546,713
Int. Cl.³ B29C *17/08*; C03C *15/00*; B44C *1/22*; B05D *5/12*
U.S. Cl. 427—96 **9 Claims**

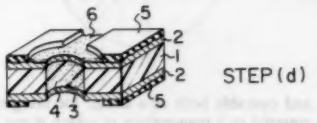
8. A method of manufacturing a multilayer circuit on a substrate having a conductive layer thereon including the steps of forming in a desired pattern a polymeric dielectric layer over the substrate and conductive layer, swelling the polymer surface with an appropriate swelling agent, etching the swelled polymer with an etch solution comprising chromic acid, sulfuric acid, phosphoric acid and water wherein the water does not exceed 0.55 volume percent and wherein the quantity of sulfuric acid and chromic acid are sufficient to etch the polymer, rinsing and neutralizing the surface, and forming a conductive coating over the surface in a desired pattern.

4,457,952

PROCESS FOR PRODUCING PRINTED CIRCUIT BOARDS

Mineo Kawamoto, Hitachi; Kanji Murakami, Mito; Yutaka Itoh, Takahagi; Youichi Matsuda, Hitachi; Motoyo Wajima, Hitachi; Hirosada Morishita, Hitachi; Shoji Kawakubo, and Toyofusa Yoshimura, both of Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 310,305, Oct. 9, 1981, abandoned. This application Apr. 15, 1983, Ser. No. 485,399
Claims priority, application Japan, Oct. 9, 1980, 55-140445
Int. Cl.³ C23C *3/02*; H05K *3/18*
U.S. Cl. 427—98 **10 Claims**



1. A process for producing a printed circuit board comprising the steps of:

(a) forming an at least partially cured adhesive layer of a homogeneous mixture of an alkaline earth metal carbonate powder in an amount sufficient to prevent transfer of a catalyst to be deposited thereon to masked portions formed after a catalyst deposition step, and a resin component containing predetermined amounts of a thermosetting resin and a synthetic rubber on one or both surfaces of an insulating substrate,

(b) roughening the adhesive layer surface or surfaces,

(c) depositing a catalyst for electroless plating to the roughened adhesive layer surface,

(d) masking portions other than circuit forming portions with a resist ink film, and

(e) forming conductive circuits by electroless plating.

4,457,953

ELECTRODE MATERIAL

James A. McIntyre, and Robert F. Phillips, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 333,592, Dec. 23, 1981, abandoned. This application Jan. 10, 1983, Ser. No. 456,939
Int. Cl.³ H01M *4/88*
U.S. Cl. 427—113 **20 Claims**

1. A method for the production of coated particles suitable for use as an electrode material comprising:

forming a fluid admixture of a particulated substrate, an electrochemically active, electrically conductive catalyst and a binder, and

bonding the catalyst to the substrate by solidifying the fluid admixture, wherein said substrate is selected from the group of materials consisting of steel, iron, graphite, nickel, platinum, copper and silver.

4,457,954

CATALYTIC GAS-SENSITIVE ELEMENTS

David W. Dabill; Stephen J. Gentry, both of Deepcar; Nicholas W. Hurst; Alan Jones, both of Sheffield, and Peter T. Walsh, Thorpe Hesley, all of England, assignors to National Research Development Corporation, London, England

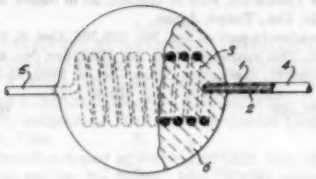
Filed Aug. 28, 1981, Ser. No. 297,502
Claims priority, application United Kingdom, Sep. 5, 1980, 8028675; Aug. 6, 1981, 8124036
Int. Cl.³ G01N *27/16*
U.S. Cl. 427—125 **20 Claims**

1. A gas-sensitive element comprising:

a catalyst material exposed for contact with a sample of an atmosphere to be tested, said catalyst material being in the form of a coherent mass produced by heating a deposit

made from an aqueous slurry of alumina containing in solution at least one compound of a metal of the platinum group, the particle size of the alumina in said slurry being no greater than 0.1 micron; and

an electrical resistor associated with said catalyst material



and operable both as a heater for bringing said catalyst material to a temperature at which it can cause combustion of at least one gas to be detected and as a thermal sensor for detecting any thermal effect on said catalyst material caused by the occurrence thereon of a combustion reaction.

4,457,955

PROCESS FOR PRODUCING MAGNETIZABLE PARTICLES

Kazuo Okamura, Itami; Kohji Tamura, Kawanishi; Shigeo Daimon, and Yoshiyuki Shibuya, both of Osaka, all of Japan, assignors to Daikin Kogyo Company, Ltd., Osaka, Japan

Filed Dec. 29, 1982, Ser. No. 454,325

Claims priority, application Japan, Dec. 29, 1981, 56-210787; Nov. 10, 1982, 57-198138

Int. Cl.³ C01G *49/06, 49/08*

U.S. Cl. 427—127 **9 Claims**

1. A process for producing cobalt-modified iron oxide particles, which comprises the steps of:

(1) forming a slurry by adding to magnetic iron oxide particles dispersed in an aqueous solution

(a) a cobalt compound,

(b) an iron component which is a combination of a ferrous compound and a ferric compound, at a Fe/Co atomic ratio in the range of 1.3 to 2.5 for the ferrous compound and 0.5 to 1.3 for the ferric compound, and

(c) an alkali at a concentration enough to cause the cobalt and iron to precipitate as hydroxides; and

(2) heating the slurry at a temperature of at least 50° C. and not higher than the reflux temperature thereof in a non-oxidizing atmosphere.

4,457,956

METHOD FOR AUTODEPOSITION ONTO A NON-METALLIC SURFACE

Kisoon Park, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 11, 1980, Ser. No. 176,770

Int. Cl.³ B05D *1/36*

U.S. Cl. 427—203 **6 Claims**

1. A method of applying an autodeposition coating onto a non-metallic surface comprising, in order, the steps of:

(A) Depositing onto said non-metallic surface a layer of powder of aluminum acetate wherein the powder has an average particle size of from 0.5 to 50 microns and is capable of releasing multivalent cations when brought into contact with an acidic aqueous solution;

(B) applying to the resulting metal compound coated non-metallic surface of step (A) an aqueous autodeposition coating having a pH of less than 5 and comprised of from 2 to 20 weight percent of resinous coating material and an oxidizing agent in an amount sufficient to provide an oxidizing equivalent of at least 0.01 per liter of said autodeposition composition, for a period of time such that a covering forms on the non-metallic surface; and

(C) curing the coating applied to said surface.

4,457,957

METHOD FOR APPLYING AN INORGANIC TITANIUM COATING TO A GLASS SURFACE

John H. Novak, Butler, and Gary L. Smay, Saxonburg, both of Pa., assignors to American Glass Research, Inc., Butler, Pa.

Continuation-in-part of Ser. No. 112,602, Jan. 16, 1980, abandoned, and Ser. No. 171,095, Jul. 22, 1980. This application Aug. 26, 1980, Ser. No. 181,621

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—226 **6 Claims**

1. In a method for applying an inorganic titanium-containing coating to a glass surface by contacting said surface at elevated temperature with a thermally decomposable tetraalkyl titanate, the improvement wherein said tetraalkyl titanate is applied to said surface as a mixture in a non-aqueous, normally-liquid vehicle selected from the group consisting of normally-liquid esters of fatty acids and silicon fluids.

4,457,958

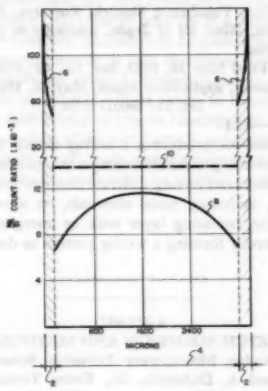
METHOD OF STRENGTHENING SILICON NITRIDE CERAMICS

Frederick F. Lange, Thousand Oaks, and David R. Clarke, Newbury Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 146,944, May 2, 1980, abandoned. This application May 22, 1981, Ser. No. 266,244

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—314 **14 Claims**



8. A method of fabricating an improved silicon nitride (Si_3N_4), structural ceramic, comprising the steps of:

providing a mixture of Si_3N_4 powder and a sufficient quantity of a densification aid to cause rapid densification due to the formation of a liquid glassy phase during sintering;

sintering said mixture to form a dense Si_3N_4 ceramic;

providing silicon dioxide (SiO_2) on the surface of said Si_3N_4 ceramic;

heating said Si_3N_4 ceramic and said SiO_2 at a temperature sufficient to cause diffusion of impurities and additive cations from silicates in said glassy phase into said SiO_2; and

grinding said Si_3N_4 ceramic to a depth sufficient to remove surface pits formed during said heating step.

4,457,959

PROCESS FOR FINISHING FISHING NETS

Gotmar Dornheim, and Edmund Giez, both of Leichlingen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 13, 1981, Ser. No. 243,232
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011710
Int. Cl.³ B05D 3/02
U.S. Cl. 427—379 8 Claims

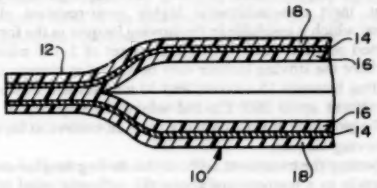
1. A process for finishing fishing nets, comprising impregnating the fishing nets, with a finish consisting of a mixture of a vinyl pyridine copolymer latex, a formaldehyde resin precondensate, formaldehyde, water and, optionally, a dye, drying the nets thus impregnated and subsequently subjecting the nets to a heat treatment at 130° C. to 180° C.

4,457,960

POLYMERIC AND FILM STRUCTURE FOR USE IN SHRINK BAGS

David L. Newsome, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Apr. 26, 1982, Ser. No. 371,781
Int. Cl.³ B32B 27/08; B65D 71/08
U.S. Cl. 428—35 26 Claims



1. An oriented multiple layer polymeric film, comprising:
(a) a first barrier layer, said first layer having two opposing surfaces;
(b) second and third layers adhered to said surfaces of said first layer, said second and third layers both having essentially the same composition;
(c) a fourth layer adhered to one of said second and third layers; and
(d) a fifth layer adhered to said fourth layer;
said second, third and fifth layers comprising ethylene vinyl acetate, and said fourth layer comprising 10% to 100% linear low density polyethylene.

4,457,961

PEARLY-LUSTERED CONTAINER

Hidezi Nakazawa, Tochigi, and Yoshiharu Hatakeyama, Tokyo, both of Japan, assignors to Yoshida Industry Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1983, Ser. No. 465,680
Claims priority, application Japan, Feb. 15, 1982, 57-18404
Int. Cl.³ B65D 35/08
U.S. Cl. 428—35 1 Claim

1. A pearl-like lustered container having a hollow body comprising:
an inner layer formed of a white opaque synthetic resinous material and forming a viewing background;
an intermediate layer having a thickness of 200 to 300 microns and formed of a transparent synthetic resinous material mixed with a predetermined amount of a coloring pigment to thereby render said intermediate layer transparent or translucent in a desired color tone;
an outer layer having a thickness of 90 to 110 microns and formed of a colorless synthetic resinous material mixed with a predetermined amount of powdered pearl essence, thereby imparting a pearl-like luster to the container; and
a protective surface film covering said outer layer and formed of a transparent material;

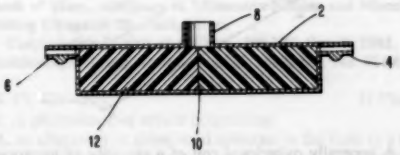
whereby one portion of light passing through said surface film enters said outer layer and diffusely reflects from particles of said pearl essence therein, another portion of said light reflects from the boundary between said intermediate and outer layers and shines on and diffusely reflects from behind said particles, and a further portion of said light passes through said intermediate layer as colored light colored by particles of said pigment therein, and thereby the color and the pearl-like luster are viewed against said background of said inner layer.

4,457,962

MOLDED ARTICLE COMPRISED OF A THERMOTROPIC LIQUID CRYSTAL LINE POLYMER WITH AN INHERENTLY WEAK WELD LINE INCORPORATED THEREIN

Michael Jaffe, Maplewood, N.J., and Zohar Ophir, Haifa, Israel, assignors to Celanese Corporation, New York, N.Y.

Filed Sep. 1, 1982, Ser. No. 413,759
Int. Cl.³ F16L 9/16; B65D 65/28; B29F 3/04
U.S. Cl. 428—36 16 Claims



1. A molded article comprised of a polymer which is capable of forming an anisotropic melt phase and which includes an inherently weak weld line incorporated therein which traverses said article and which enables said article to be readily separated into separate and distinct portions of predetermined dimension by application of sufficient load whereby said article is caused to separate into said portions at said weld line.

4,457,963

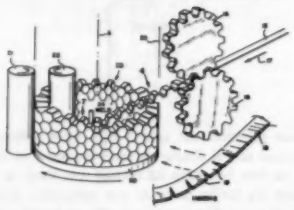
HONEYCOMB MANUFACTURING METHOD AND PRODUCT

Nelson C. Ittner, P.O. Box 2610, Blue Jay, Calif. 92317, and Gary N. Ittner, 12610 Braddock Dr., Los Angeles, Calif. 90066

Division of Ser. No. 364,808, Apr. 2, 1982, Pat. No. 4,411,381. This application Aug. 15, 1983, Ser. No. 523,130

Int. Cl.³ B32B *3/12*

U.S. Cl. 428—36 2 Claims



1. A honeycomb product including a ribbon of core material corrugated in a manner to define a first truncated triangular wave form along one longitudinal edge when viewing the ribbon from one side and a second truncated triangular wave form along the opposite longitudinal edge when viewing the ribbon from the opposite side, the height of the first truncated triangular wave form being greater than the height of the second truncated triangular wave form so long as the longitudinal edges follow a straight path, whereby when ribbons of core material so formed are stacked one above the other and curved to form a cylinder in which the outside wall is defined by said one longitudinal edge and the inside wall is defined by said opposite longitudinal edge, the heights of the truncated triangular wave forms are equalized so that the lateral wall of the cylinder is rectilinear in a direction parallel to the axis of the cylinder and the planes of the nodes of the honeycombs making up the cylinder are normal to the axis of the cylinder.

4,457,964

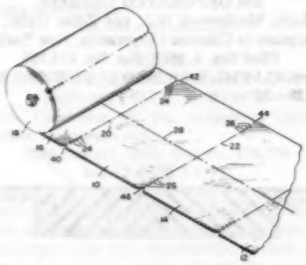
PLACE MAT

Bernard Kaminstein, 29 Third Ave., New York, N.Y. 10003

Filed May 28, 1982, Ser. No. 383,022

Int. Cl.³ B65D *3/02*

U.S. Cl. 428—43 21 Claims



1. A generally cylindrical roll of a plurality of juxtaposed non-slip place-mat articles oriented in a line, each of which comprises a generally rectangular planar flexible web, said web being multi-layered, the four corners of said web being rounded off, so that each corner is defined by a curved periphery, and said web comprising an outer layer composition coating on both sides, said composition coating comprising a blend of water, a water-soluble salt, a wax, and a polymeric material having a molecular weight greater than the wax each of said place mats being contiguously attached to adjacent place mats, in tandem, by a weakened zone comprising two associated rectilinear arrays of spaced-apart substantially circular perforations between each two adjacent place mats, each array of circular perforations extending transverse to the longitudinal axis of the line of placemats, the two associated arrays of each weakened zone extending for only a portion of the length of said weakened zone, whereby each place mat may be removed individually from said roll without causing unwanted removal of the next adjacent place mat from said roll.

4,457,965

PROCESS FOR LACQUERING ARTICLES & ARTICLES LACQUERED THEREWITH

Johan P. Rocholl, Zwijndrecht, and Hendrikus De Jong, Maasdam, both of Netherlands, assignors to Hunter Douglas International N.V., Netherlands

Filed Feb. 4, 1982, Ser. No. 345,727

Claims priority, application Netherlands, Mar. 16, 1981, 8101280

Int. Cl.³ D06N *7/04*

U.S. Cl. 428—141 6 Claims

1. A process for producing a lacquered article which comprises the steps of applying one or more layers of lacquer to an article by which at least the top layer comprises a stoving lacquer having a binder, a finely divided, high molecular weight, inert non-elastomeric highly wear-resistant plastic material which is insoluble in the stoving lacquer in the form of dispersed particles each having a diameter of 2–100 microns, and where the stoving lacquer may be stoved at stoving times extending between 15 seconds and 30 minutes and at stoving temperatures up to 300° C., and where the majority of said particles protrude at least partially from an outermost layer of said stoving lacquer;

subjecting the outermost layer of the stoving lacquer on the article to a temperature above the softening point of the particles; and

maintaining said temperature to partially melt parts of the particles protruding from the outermost layer to cause said parts to take a rounded form and to flow out over the surface of the outermost layer in the vicinity of the particles where the outermost layer is in at least a partially dried or hardened state.

6. An article made by the process of any one of claims 1 and 2–5.

4,457,966

COVER-SUBSTRATE SUPPORT MATERIAL

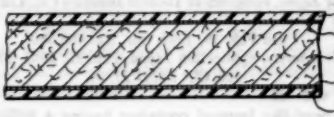
Gunter Pusch, Bannholzweg 12, 6903 Neckargemünd-Dilsberg, Fed. Rep. of Germany; Alexander Hoffman, Mauer; Dieter E. Aisslinger, Geisenheim, and Klaus W. Pusch, Neckargemünd-Dilsberg, all of Fed. Rep. of Germany, assignors to Gunter Pusch, Neckargemünd-Dilsberg, Fed. Rep. of Germany

Filed Sep. 9, 1980, Ser. No. 184,789

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1979, 7925505[U]; Mar. 7, 1980, 3008850

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—204 8 Claims



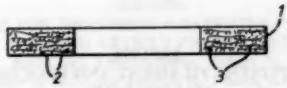
1. Cover-substrate material provided with a layer reflecting thermal radiation preferably between 5 and 25 micron wavelength, and deposited thereon a protective thermoplastic binder layer with chrominance carriers dispersed therein to provide arbitrarily adjustable absorption bands in the region

from 400 to 900 nm wavelength and extensively transparent in the reflecting region of the thermally reflecting layer, but opaque to visible light.

4,457,967
BRAKE DISC OF CARBON-CARBON COMPOSITE MATERIAL

Jean-Louis Chareire, Levallois-Perret, and Guy Dupupet, Ermont, both of France, assignors to Le Carbone-Lorraine of Tour Manhattan, Courbevoie, France

Filed Jun. 24, 1982, Ser. No. 391,977
Claims priority, application France, Jul. 1, 1981, 81 12929
Int. Cl.³ B32B *9/00*; F16B *69/00*
U.S. Cl. 428—212 **5 Claims**



1. A brake disc of carbon-carbon composite material and having friction faces, comprising a substrate of a mixture of short carbon fibres of two very different length ranges embedded in a carbon matrix, in which the longer fibres are oriented and distributed randomly in planes approximately parallel to the friction faces of the disc and the shorter fibres are oriented and distributed randomly in the volume of the disc.

4,457,968
PROCESS FOR MANUFACTURE OF A POLY (PERFLUOROOLEFIN) BELT AND A BELT MADE THEREBY

Roger J. Harvey, Tallahassee, Fla., assignor to Niagara Lockport Industries, Inc., Quincy, Fla.

Filed Aug. 2, 1983, Ser. No. 519,673
Int. Cl.³ B32B *27/02*; D03D *3/04, 15/00*; D21F *7/08*
U.S. Cl. 428—229 **14 Claims**

1. A process for making a substantially nonstretchable belt used in the manufacture of matt material, which comprises:

weaving poly (perfluoroolefin) monofilament at a load bearing filament content of about 15 to 200 and a non-load bearing filament content of about 15 to 200 filaments per inch with from 55 to 90% of the filaments being in the load bearing direction of the weave to produce a woven belt; and

thermally fixing said belt by applying a force of 5 PLI to 30 PLI to the belt in the load bearing direction while heating said belt to a temperature substantially close to the white point for about 10 seconds to 30 min to produce a substantially thermally stable belt.

9. A substantially nonstretchable belt for manufacture of matt material, which comprises:

a multilayer woven fabric of poly(perfluoroolefin) monofilament having about 15 to 200 load bearing filaments and 15 to 200 non-load bearing filaments per inch with from 55 to 90% of the filaments of the weave being load bearing filaments; a load bearing crimp of from 1% to 30%, the total load and non-load bearing crimp being from 5 to 35% and a regular pattern of load and non-load crimp knuckles; and wherein at least 80% of the non-load bearing crimp has been developed by crimp interchange from the load bearing crimp; at least 2 percent of the crimp knuckles have been been transferred from the load bearing to the non-load bearing filaments; the air permeability of the fabric is from 50 to 2000 cu. ft. per min. per sq. ft. of fabric at a pressure drop of 0.5 inches of water; and portions of the filaments at the knuckle junctions between the load and non-load filament directions are permanently shape deformed so as to adopt a sharply bent conformation and provide mechanical interlocking of the filaments.

4,457,969
FIRE-RESISTANT, LIGHT STABLE TEXTILE STRUCTURE

John Biale, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 450,192, Dec. 16, 1982. This application Apr. 18, 1983, Ser. No. 486,032
Int. Cl.³ D04H *1/58*
U.S. Cl. 428—288 **23 Claims**

1. A fire-resistant, light-stable textile structure comprising a mat of fibers held together with a vinylidene chloride interpolymer containing a light-stabilizing amount of a nitrile-containing comonomer in interpolymerized form.

4,457,970
GLASS FIBER REINFORCED THERMOPLASTICS

Balbhadra Das, Allison Park, and Carl A. Melle, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 21, 1982, Ser. No. 390,090
Int. Cl.³ B32B *17/04*
U.S. Cl. 428—290 **13 Claims**

1. Glass fibers having present thereon an aqueous treating composition wherein the glass fibers are gathered into a plurality of glass fibers, wherein the aqueous treating composition comprises:

at least about 0.3 weight percent of the treated glass fiber strand where the composition has in weight percent of the aqueous composition,

a. about 0.05 to about 3 weight percent of a vinyl-containing coupling agent;

b. an epoxidized polar thermoplastic copolymer having about 2 to about 12 parts of the epoxidized monomer per 100 parts of copolymer and has a glass transition temperature from about −10° C. to about 70° C.,

c. an unhydrolyzed or partially hydrolyzed organo-reactable silane coupling agent present in the amount of about 0.01 to about 1.2 weight percent,

d. a lubricant in the range of about 0.1 to 3 weight percent of the aqueous sizing composition,

e. an amount of water sufficient to make the percent solids of the aqueous composition in the range from about 1 to about 40 weight percent.

4,457,971
LITHOGRAPHIC SUBSTRATE AND ITS PROCESS OF MANUFACTURE

Donald E. Cadwell, St. Paul, and Larry A. Brey, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 299,720, Sep. 8, 1981, abandoned. This application Aug. 26, 1982, Ser. No. 411,626
Int. Cl.³ B32B *5/16*
U.S. Cl. 428—323 **11 Claims**

1. A photosensitive article comprising:

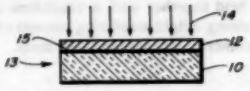
A. an aluminum or aluminized substrate in the form of a film or sheet bearing on at least one aluminum or aluminized surface thereof a hydrophilic ceramic layer comprising (1) non-metallic inorganic particles and (2) a water-resistant phase, or phases, of a dehydration product of at least one monobasic phosphate; said ceramic layer having a thickness between 0.2 and 15 micrometers and

B. a photosensitive lithographic coating over said ceramic layer.

4,457,972
ENHANCED ADHESION BY HIGH ENERGY BOMBARDMENT

Joseph E. Griffith, Pasadena, Calif.; Yuanxun Qiu, Shanghai, China, and Thomas A. Tombrello, Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Dec. 7, 1981, Ser. No. 327,896
Int. Cl.³ B32B 7/04, 15/04
U.S. Cl. 428—334 22 Claims



1. A method of improving the adhesion of a first surface to a surface of an electrical insulator having a resistivity exceeding 10^3 ohm-cm comprising the steps of:
bringing two surfaces into contact; and
applying high energy ions having an energy of at least 0.1 MeV/amu to the insulator for a time sufficient to improve adhesion.

18. A laminate comprising:
a first electrical insulator layer having a resistivity exceeding 10^3 ohm-cm; and a directly abutting, a second layer adhered to the first layer by means of a mixed interface formed by applying high energy ions having an energy of at least 0.1 MeV/amu to said interface.

4,457,973
CONDUCTIVE COMPOSITE FILAMENTS AND METHODS FOR PRODUCING SAID COMPOSITE FILAMENTS

Masao Matsui, Takatsuki; Hiroshi Naito, and Kazuo Okamoto, both of Osaka, all of Japan, assignors to Kanebo Synthetic Fibers Ltd., Osaka and Kanebo, Ltd., Tokyo, both of, Japan

Division of Ser. No. 268,026, May 28, 1981, Pat. No. 4,420,534. This application Feb. 24, 1983, Ser. No. 469,367
Claims priority, application Japan, Jun. 6, 1980, 55-76901; Jun. 14, 1980, 55-80753; Jun. 19, 1980, 55-83650
The portion of the term of this patent subsequent to Dec. 13, 2000, has been disclaimed.
Int. Cl.³ D02G 3/00
U.S. Cl. 428—372 22 Claims

1. A conductive composite filament comprising a conductive component composed of electrically conductive metal oxide particles and at least one polymer selected from the group consisting of thermoplastic polymers and solvent-soluble polymers, bonded to an electrically non-conductive component composed of a fiber-forming polymer, said electrically conductive metal oxide particles comprising a core made of titanium oxide, the surface of said core being coated with an electrically conductive tin oxide.

17. A unitary, elongated, electrically conductive, bi-component filament which is transverse cross section consists essentially of an electrically conductive component in the form of one or more relatively thin, elongated layers which extend transversely of the cross section of the filament and the remainder of the filament being an electrically non-conductive component, said electrically conductive component being made of a mixture of electrically conductive metal oxide particles, said metal oxide particles comprising a core which consists essentially of titanium dioxide, the surface of said core being coated with electrically conductive tin oxide, with at least one polymer selected from the group consisting of thermoplastic polymers and solvent-soluble polymers, said electrically non-conductive component being made of a thermoplastic fiber-forming polymer, at least one exposed end of each said layer being exposed on the outer surface of the filament, the opposite surfaces of each said layer being adhered to said electrically non-conductive component, said layer or layers having a specific resistance of not more than 10^7 ohm-cm, said layer or layers occupying from 1 to 40% of the total cross-sectional area of the filament and the exposed end or ends of said layer or layers occupying from 1 to 30% of the total surface area of the filament.

4,457,974
BICOMPONENT FILAMENT AND PROCESS FOR MAKING SAME

James T. Summers, Chattanooga, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

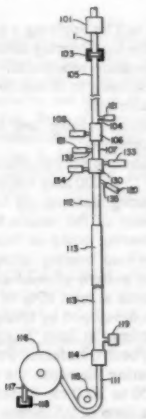
Filed Jul. 14, 1980, Ser. No. 168,152
Int. Cl.³ D02G 3/04
U.S. Cl. 428—373 3 Claims

1. A process for the production of nylon/polyester bicomponent filaments which comprises simultaneously spinning through the same spinneret capillary, nylon and polyester, said polyester being substantially free of a compound which will react with the nylon to form a deposit on the walls of the spinneret capillary.

4,457,975
TREE RESISTANT POWER CABLE

George Bahder, Edison, N.J., assignor to Cable Technology Laboratories, Inc., New Brunswick, N.J.

Continuation of Ser. No. 235,090, Feb. 17, 1981, Pat. No. 4,354,992, which is a continuation-in-part of Ser. No. 147,212, May 6, 1980, abandoned. This application Jun. 23, 1982, Ser. No. 391,348
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.³ B29F 3/10
U.S. Cl. 428—394 8 Claims



1. A method for fabricating an electrochemical tree resistant high voltage electrical cable, said method comprising the steps of:

extruding a multi-layer insulation structure over a continuously advancing stranded cable conductor;

curing the insulation structure by applying a pressurized curing medium to the outer surface thereof;

gradiently cooling the cable to approximately room temperature with a pressurized cooling fluid; and

applying internal pressure through said conductor outwardly against the insulation structure, and maintaining the internal pressure throughout said cooling step, said internal pressure being less than that of said cooling fluid.

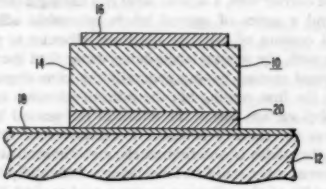
2. An electrochemical tree resistant high voltage electrical cable manufactured by the method of claim 1.

4,457,976

METHOD FOR MOUNTING A SAPPHIRE CHIP ON A METAL BASE AND ARTICLE PRODUCED THEREBY

Thomas J. Faith, Jr., Lawrenceville; Robert S. Irven, Belle Mead, both of N.J., and Sabrina K. Plante, Arlington, Va., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,518
Int. Cl.³ B32B *15/04*; B23K *31/02*
U.S. Cl. 428—457 **8 Claims**



1. An assembly comprising:

a metal substrate,

a sapphire chip seated on a surface of said substrate, and

a bonding layer of gold-silicon eutectic directly contacting and bonded to a surface of said substrate and a bare surface of said sapphire chip so as to secure said sapphire chip to said substrate.

4. A method of bonding a sapphire chip to a metal substrate comprising the steps of:

placing a preform of a gold-silicon between and in direct contact with a bare, uncoated surface of said sapphire chip and a surface of said substrate, and

heating said assembly until the preform flows and bonds to each of said sapphire chip and substrate.

4,457,977

METALLIZED PLASTIC ARTICLES

Wilhelm E. Walles, Freeland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 30, 1981, Ser. No. 307,054
Int. Cl.³ B65D *1/00*
U.S. Cl. 428—463 **9 Claims**

1. A diffusion barrier structure comprising a substrate of an organic plastic material having an adherent continuous coating of an organic polymer which exhibits a permeance to gases of the atmosphere of less than 0.4 cc-mm/m^2-atm-day deposited on the surface thereof, wherein said coating has a coating weight from about 60 to about 2500 micrograms per square centimeter, said organic polymer having a water-wettable surface which has a continuous metal layer having a total weight from about 20 to 10 $\mu g/cm^2$ deposited thereon and adherent thereto.

4,457,978

FORMALDEHYDE DEPRESSED PARTICLE BOARD

Stanley Wawzonek, 2014 Ridgeway Dr., Iowa City, Iowa 52240

Filed May 16, 1983, Ser. No. 494,908
Int. Cl.³ B32B *21/08*
U.S. Cl. 524—14 **19 Claims**

1. A method of preparing formaldehyde suppressed particle board which employs a formaldehyde resin adhesive for bonding the particles of said board, comprising:

uniformly coating particles used in making said board with a adhesive mixture which is a formaldehyde resin containing a small but formaldehyde suppressing effective amount of a weak acid which is substantially inert to formaldehyde resins, and calcium metasilicate, and pressing the coated particles into a particle board.

17. A urea formaldehyde resin containing particle board of substantially reduced formaldehyde outgassing properties, said board comprising:

about 90% of wood chips;

about 10% of a urea formaldehyde resin mix;

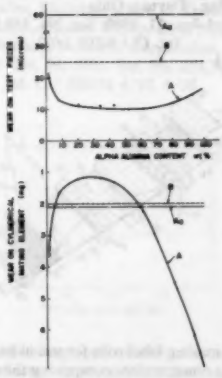
said mixing containing a small but suppression effective amount of calcium metasilicate and a weak acid which is substantially inert to urea formaldehyde resin.

4,457,979

COMPOSITE MATERIAL INCLUDING ALPHA ALUMINA FIBERS

Tadashi Donomoto; Mototsugu Koyama, both of Toyota; Joji Miyake, Okazaki, and Yoshio Fuwa, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 25, 1982, Ser. No. 392,143
Claims priority, application Japan, Nov. 30, 1981, 56-191923
Int. Cl.³ B21D *39/00*; B32B *7/00*
U.S. Cl. 428—614 **2 Claims**



1. A fiber reinforced metal type composite material: in which the fiber reinforcing material is alumina fiber material formed from at least 80% by weight alumina and the remainder substantially silica, with the alpha alumina content of the alumina approximately between about 5% and about 60% by weight of the total amount of alumina; and in which the matrix metal is selected from the group consisting of aluminum, magnesium, and their alloys.

4,457,980

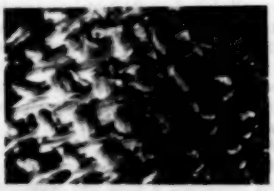
TEXTILE FABRICS WITH OPAQUE PIGMENT PRINTING AND METHOD OF PRODUCING SAME

John Y. Daniels, Pineville, N.C., and James C. Stevenson, Fort Mill, S.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Continuation-in-part of Ser. No. 294,782, Aug. 20, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,794

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—196 34 Claims



1. A printed textile fabric formed of interengaged yarns of a predetermined color, selected areas of said fabric having printed pattern areas of predetermined color contrasting with the color of said yarns, said printed pattern areas being substantially opaque and thus unaffected by the color of said yarns, and said pattern areas comprising an opaque coating covering the exposed surfaces of the intergaged yarns and hiding the underlying color of the yarns, and being further characterized by penetrating into the fabric to the back side thereof and individually coating each of the yarns in the printed area such that the interengaged yarn structure of the fabric remains visible, said coating comprising an opacifying pigment providing opacity in said coating and cured water insoluble polymer binder affixed to said yarns and bonding said opacifying pigment to the yarns.

4,457,981

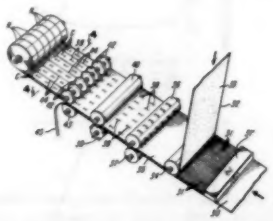
COMPOSITE LABEL WEB ROLLS AND METHOD OF MAKING SAME

William A. Jenkins, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jun. 11, 1980, Ser. No. 158,543

Int. Cl.³ B32B *1/00*

U.S. Cl. 428—41 9 Claims



1. Method of making label rolls for use in hand-held labelers of the same basic construction, comprising the steps of: providing a relatively wide first label material web and a relatively wide release-coated first carrier web, applying a first coating of pressure sensitive adhesive to one side of the first label material web, laminating the first label material web and the first carrier web with the first coating being adhered to the release-coating first carrier web to form a first composite web, providing a relatively wide second label material web and a relatively wide release-coated second carrier web, applying a second coating of pressure sensitive adhesive to one side of the second label material web, the second coating having generally the same degree of adhesion as the first coating but the ratio of adhesive to adhesive-free label material surface across the width of the second label material web being less than the ratio of adhesive to adhesive-free label material surface across the width of the first label material web, laminating the second label material web and the second carrier web with the second coating being adhered to the release-coated second carrier web to form a second composite web, cutting the first label material web laterally at longitudinally spaced intervals and thereafter slitting the first composite web into a series of relatively narrow composite label strips having a series of first labels, winding the first label strips into first label rolls, cutting the second label material web laterally at longitudinally spaced intervals and thereafter slitting the second composite web into a series of relatively narrow second composite label strips having a series of second labels, winding the second labels strips into second label rolls, and the total width of the adhesive applied across the width of the first and second labels being substantially equal for requiring substantially the same amount of stripping force to delaminate the first labels as is required to delaminate the second labels.

6. A set of label rolls of different widths for use in hand-held labelers of the same basic construction, comprising: a first label roll having a first carrier web and a series of first labels releasably adhered by a first coating of pressure sensitive adhesive to the first carrier web, a second label roll having a second carrier web and a series of second labels releasably adhered by a second coating of pressure sensitive adhesive to the second carrier web, the second labels being wider than the first labels, the second coating having generally the same degree of adhesion as the first coating but the ratio of adhesive to adhesive-free label surface across the width of the second labels being less than the ratio of adhesive to adhesive-free label surface across the width of the first labels, and the total width of the adhesive across a said first label being substantially equal to the total width of the adhesive across a said second label for requiring substantially the same amount of stripping force to delaminate the first labels as to delaminate the second labels.

4,457,982

ACICULAR FERRIMAGNETIC IRON OXIDE AND ITS PREPARATION

Peter Rudolf, Neuhofen; Jenoe Kovacs, Hessheim; Guenter Vaeth, Limburgerhof, and Manfred Ohlinger, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 28, 1983, Ser. No. 461,746

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1982, 3204547

Int. Cl.³ C01G *49/06*

U.S. Cl. 428—403 3 Claims

1. A modified acicular ferrimagnetic iron oxide which consists of a core of gamma-iron(III) oxide and a surrounding shell of gamma-iron(III) oxide modified by tin dioxide and carbon, and wherein the amount of tin dioxide is from 0.15 to 1.5% by weight and the amount of carbon is from 0.1 to 1% by weight, the percentages in each case being based on the total amount of the modified ferrimagnetic iron oxide.

4,457,983

ROOFING SHEET WITH UPPER LAYER OF HIGHER MELTING POINT THAN ASPHALT

Walter E. Maile, Rochester, and David Q. Boone, Holland, both of Mich., assignors to Northern Fibre Products Co., Birmingham, Mich.

Filed May 24, 1982, Ser. No. 381,333

Int. Cl.³ B32B *7/00*

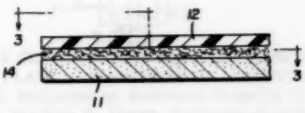
U.S. Cl. 428—213 1 Claim

1. A roofing sheet for application by use of heat upon a roof surface and the like, consisting of:

a unitary relatively thin, flexible sheet suitable for being coiled into a roll and formed of a lamination of a lower

layer of asphalt, an upper layer of a synthetic plastic material, and a middle layer of fabric material wherein said synthetic plastic material consisting of an ethylene vinyl acetate and said fabric layer being formed of a non-woven, synthetic fiber material which is mechanically bonded into the adjacent surfaces of the two layers and said asphalt layer being roughly twice as thick as the ethylene vinyl acetate layer and with the middle non-woven synthetic fiber layer being considerably thinner than the ethylene vinyl acetate layer;

said plastic material having a melting point which is considerably higher than the melting point of asphalt so that the application of heat to the asphalt for softening it will not affect the layer of ethylene vinyl acetate, said plastic material being monolithic and water impervious, and said asphalt layer forming a heat softenable indicator surface



while said opposing plastic layer forming a heat resistant, water impervious surface;

said middle fabric layer being formed of fibers having a melting point which is considerably higher than asphalt and being locked to the asphalt layer and serving as a reinforcement for stabilizing the sheet dimensionally, and holding the upper and lower layers together, and also holding the asphalt layer intact during the times of any shrinkage and cracking thereof, due to the sheet being exposed to relatively cold temperatures, until the asphalt layer self-heals any such cracks when subjected to natural warmth; and

said asphalt indicator layer softening and then melting in response to flame heating of said asphalt layer thereby providing a signal to a roofer that he has exceeded the maximum heat to be used at any particular location on said sheet.

4,457,984

CARBON ARTIFICIAL PROSTHETIC MATERIAL

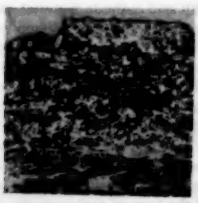
Sugio Otani, 2010-2,, Kurokawa, Hishi-machi, Kiryu-shi, Gunma-ken; Sadakatsu Yanagisawa, 3-34-407, Mita 2-chome, Minato-ku, Tokyo, and Kunio Niijima, No. 563, Kamikomachi, Ohmiya-shi, Saitama-ken, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo; Sugio Otani, Kiryu; Sadakatsu Yanagisawa, Tokyo and Kunio Niijima, Ohmiya, all of, Japan

Filed Jan. 29, 1982, Ser. No. 343,932

Claims priority, application Japan, Feb. 12, 1981, 56-19519

Int. Cl.³ B32B *9/00*

U.S. Cl. 428—220 **5 Claims**



1. An artificial prosthetic material made substantially of a carbon source and having a graduated porous structure layer comprising:

randomly piled non-woven fibrous material; and

pyrolytic carbon deposited on the fibrous material to bond the material together; said porous structure layer having a thickness of at least about 0.1 mm and pores of at least about 100 μm in diameter at the surface and gradually reduced inside the layer.

4,457,985

BALLISTIC-RESISTANT ARTICLE

Gary A. Harpell, Morristown; Sheldon Kavesh, Whippany; Igor Palley, Madison, and Dusan C. Prevorsek, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 359,975, Mar. 19, 1982, Pat. No. 4,403,012. This application Feb. 18, 1983, Ser. No. 466,496

The portion of the term of this patent subsequent to Sep. 6, 1990, has been disclaimed.

Int. Cl.³ D03D *3/00*

U.S. Cl. 428—224 **16 Claims**

1. A ballistic-resistant article of manufacture comprising a flexible network of polyolefin fibers having, in the case of polyethylene fibers, a weight average molecular weight of at least about 500,000, a tensile modulus of at least about 300 g/denier and a tenacity of at least about 15 g/denier, and in the case of polypropylene fibers, a weight average molecular weight of at least about 750,000, a tensile modulus of at least about 160 g/denier and a tenacity of at least about 8 g/denier, said fibers being formed into a network of sufficient thickness to absorb the energy of a projectile.

4,457,986

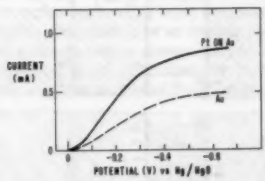
USE OF UNDERPOTENTIAL DEPOSITED LAYERS OF METALS ON FOREIGN METAL SUBSTRATES AS CATALYSTS FOR ELECTROLYTIC CELLS

Perminder S. Bindra, Ossining; Allan P. David, Binghamton, and David N. Light, Putnam Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,746

Int. Cl.³ H01M *4/92, 8/08*

U.S. Cl. 429—40 **20 Claims**



1. In a fuel cell including a pair of electrodes and an electrolyte between said electrodes housed within a chamber adapted for supplying fuel to said electrodes,

the improvement comprising provision of a gold substrate serving as the negative electrode of said fuel cell,

said electrolyte containing a species of ion of a predetermined metal which metal deposits on said gold substrate at an underpotential

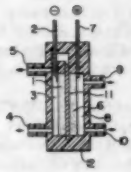
said gold substrate carrying an underpotential layer of said predetermined metal serving as a catalyst metal for the reduction-oxidation reactions of oxygen and other fuels of said fuel cell.

4,457,987

LIQUID FUEL CELL

Tatsuo Horiba, Hitachi; Seizi Takeuchi, Hitachiota; Kohki Tamura, Hitachi; Go Kawamura, and Tetsuichi Kudo, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 212,139, Dec. 2, 1980, abandoned. This application Sep. 17, 1982, Ser. No. 419,307
Claims priority, application Japan, Dec. 4, 1979, 54-157801
Int. Cl.³ H01N 4/86
U.S. Cl. 429—41 7 Claims



1. A liquid fuel cell comprising:

an anode made of carbon powders carrying an electrode catalyzer, said anode being adapted to be supplied with a liquid fuel and having as a whole a homogeneous and porous structure which has a porosity of 65–85% and in which pores of 20–100 μm occupy at least thirty percent of the total pore volume of said homogeneous and porous structure;

a gas-permeable cathode supplied with an oxidizer;

a separator interposed between said anode and said cathode; and

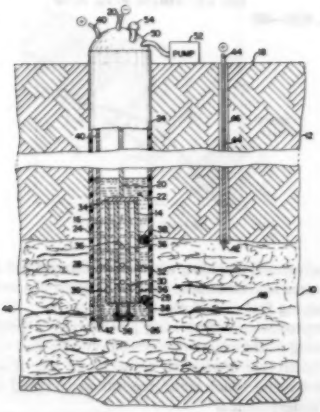
a casing for accommodating therein said anode, said cathode, said separator and an electrolyte, said electrolyte existing at least in said separator.

4,457,988

EARTH BATTERY

John J. Ryeczek, R.D. #1, Box 190C, Point Marion, Pa. 15474

Filed Jun. 4, 1982, Ser. No. 384,781
Int. Cl.³ H01M 14/00
U.S. Cl. 429—47 21 Claims



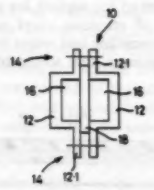
1. In an electric battery including a pair of spaced electrodes and an electrolyte in the space between the electrodes and in contact therewith, the improvement comprising: one of said electrodes being a solid veined material located in the earth.

4,457,989

ELECTROCHEMICAL CELL AND AN ANODE STRUCTURE FOR AN ELECTROCHEMICAL CELL

Johan Coetzer, Pretoria, South Africa, assignor to South African Inventions Development Corporation, South Africa

Filed Sep. 28, 1981, Ser. No. 306,904
Claims priority, application South Africa, Oct. 9, 1980, 80/6256
Int. Cl.³ H01M 4/02, 10/39
U.S. Cl. 429—102 17 Claims



1. A composite anode structure comprising

a substantially non-electronically conductive micromolecular sieve carrier wherein electrochemically active anode material in the form of an electronically conductive electropositive substance is sorbed and held in dispersed form; and

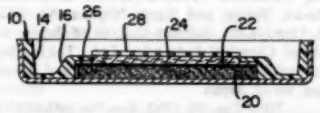
a reservoir or source of the electropositive substance in contact with the carrier, for use with a compatible electrolyte and cathode in an electrochemical cell wherein the electropositive substance of the reservoir is molten and is separated by the carrier from the electrolyte.

4,457,990

THIN MINIATURE CELL CONSTRUCTION WITH RESHAPED GASKET

Gary R. Tucholski, Parma Heights, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 19, 1982, Ser. No. 359,775
Int. Cl.³ H01M 2/18, 6/12
U.S. Cl. 429—162 4 Claims



1. In a galvanic cell comprising a container having a base, a sidewall and an open end housing a cathode material in electrical contact with said cell container, an anode material, a separator between said anode and said cathode, an electrolyte in ionic contact with said cathode material and said anode material, a cell cover disposed over the open end of the container and in electrical contact with said anode material, and a sealing gasket compressed between said cover and said container; the improvement wherein said sealing gasket comprises a horizontal base having an inner flange and an outer flange; said outer flange disposed adjacent to the inner sidewall of the container and compressed between the container sidewall and the edge of the cover thereby electronically insulating said cover from said container and sealing said cover to said container; said inner flange and the base of the container defining a chamber which contains the cathode and the separator thereon and wherein the upper portion of the inner flange of the gasket is turned inwardly and compressed on top of the outer edge of the separator to define a cavity between the separator and the cover such that the anode is entirely positioned in said cavity

thereby effectively isolating the cathode from making electronic contact with the anode and cover of the cell.

4,457,991

SEALANT FOR LITHIUM CELLS

Ralph H. Feldhake, Verona, Wis., assignor to Rayovac Corporation, Madison, Wis.

Filed Nov. 15, 1982, Ser. No. 441,949
Int. Cl.³ H01M 2/08
U.S. Cl. 429—174 **5 Claims**

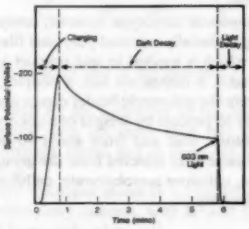
1. An improved button cell, the cell including a conductive can and cover, anodic material, cathodic material, an electrolyte, a separator interposed between the anodic material and the cathodic material, and a sealing grommet disposed between the can and cover, wherein the improvement comprises the grommet coated with atactic polypropylene.

4,457,992

ETCHABLE ELECTROPHOTOGRAPHIC LONG-RUN PRINTING PLATE AND METHOD OF MAKING SAME

Himangshu R. Bhattacharjee, Rockaway; Frederick R. Hopf, Parsippany, and Karl W. Beeson, Princeton, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 9, 1983, Ser. No. 492,771
Int. Cl.³ G03G 13/26
U.S. Cl. 430—49 **29 Claims**



1. An etchable electrophotographic printing plate comprising:

(a) an electroconductive support;

(b) a coating on a surface of the electroconductive support of effective amounts of a photoconductive zinc oxide and of a sensitizing dye dispersed in an organic resin binder, wherein said resin comprises about 60–90 weight percent of C_2–C_4 alkenyl C_2–C_8 alkanoate, about 5–30 weight percent of di(C_1–C_8 alkyl) C_4–C_8 alkenedioate, about 2–8 weight percent of C_3–C_8 alkenoic acid or C_4–C_8 alkenedioic acid, and about 0.5–5.0 weight percent of a cross-linking agent.

4,457,993

ELECTROPHOTOGRAPHIC PROCESS OF RETENTION TYPE

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

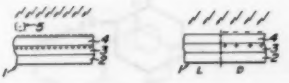
Filed Sep. 27, 1982, Ser. No. 423,740
Claims priority, application Japan, Oct. 9, 1981, 56-160308
Int. Cl.³ G03G 13/24
U.S. Cl. 430—54 **10 Claims**

1. An electrophotographic process for forming a plurality of copies of an original from the same and single electrostatic charge image once formed on a photosensitive member which comprises a conductive substrate, a photoconductive layer and an insulating layer, the layers being applied on the conductive substrate, said process comprising the steps of:

(a) effecting simultaneously an imagewise exposure of the original and charging the photosensitive member to form a latent charge image thereon;

(b) subjecting the photosensitive member to a uniform exposure to such an extent that the charge image has an electrostatic contrast which is equal to 60 to 90 percent of the maximum attainable electrostatic contrast;

(c) developing the charge image with a toner to form a toner image;



(d) transferring the toner image onto a record member to form a copy;

(e) repeating said developing and transferring steps for the same and single latent image to form a plurality of copies; and

(f) subjecting the photosensitive member to an additional uniform exposure during said repeating step to restore the electrostatic contrast of the latent charge image.

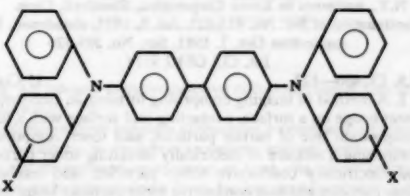
4,457,994

PHOTORESPONSIVE DEVICE CONTAINING ARYLMETHANES

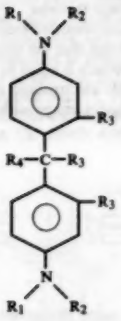
Damodar M. Pai, Fairport, and John F. Yanus, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 10, 1982, Ser. No. 440,782
Int. Cl.³ G03G 5/10
U.S. Cl. 430—59 **17 Claims**

1. An improved layered photoresponsive device comprised of a substrate, a photogenerating layer, comprised of inorganic photoconductive composition, or an organic photoconductive composition, a charge carrier transport layer in contact with the photogenerating layer, which transport layer is comprised of electrically active molecules of the formula:



dispersed in a highly insulating and transparent organic resinous material, wherein X is selected from the group consisting of (ortho) CH_3, (meta) CH_3, (para) CH_3, (ortho) Cl, (meta) Cl, (para) Cl; and as a top coating in contact with the charge carrier transport layer, an arylmethane of the formula:



wherein R_1 and R_2 are independently selected from the group consisting of alkyl groups, aryl groups, alkylaryl groups and arylalkyl groups, R_3 is independently selected from the group consisting of hydrogen, and methyl, R_4 is independently selected from the group consisting of alkyl groups, alkylaryl groups, arylalkyl groups, and a disubstituted aminophenyl group, wherein the substituents are independently selected from the group consisting of alkyl, aryl, alkylaryl, and arylalkyl.

4,457,995

LIQUID DEVELOPER CONTAINING DIPHATIC ALCOHOL FOR ELECTROSTATIC PHOTOGRAPHY AND DEVELOPMENT PROCESS USING THE SAME

Shinpei Ikenoue; Kazuo Ishii, and Akira Kashiwabara, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 24, 1982, Ser. No. 423,372

Claims priority, application Japan, Sep. 24, 1981, 56-151160

Int. Cl.³ G03G *9/12*

U.S. Cl. 430—115 **19 Claims**

1. A liquid developer for electrostatic photography comprising: toner particles selected from the group consisting of pigment particles and oleophilic polymer particles dispersed in a highly electrically insulating organic carrier fluid, the fluid having an electric resistance greater than $10^9\Omega$.cm and a dielectric constant lower than 3, and a branched aliphatic alcohol having 10 or more carbon atoms, the alcohol being present in an amount of 0.1 to 40 parts by weight per one part by weight of the toner particles, the organic carrier fluid being present in an amount from 30 to 1500 parts by weight per one part by weight of the toner particles.

4,457,996

TRIBO INDUCTION TONER COMBINATION FOR CARRIERLESS DEVELOPMENT

Lloyd F. Bean, Rochester, and Roger L. Miller, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 813,022, Jul. 5, 1977, abandoned. This application Oct. 7, 1981, Ser. No. 309,526

Int. Cl.³ G03G *9/14*

U.S. Cl. 430—122 **15 Claims**

1. A method of imaging comprising forming an electrostatic latent image on a surface, contacting said surface with a toner composition free of carrier particles, said toner composition comprising a mixture of electrically insulating toner particles and electrically conductive toner particles, said insulating toner particles and said conductive toner particles being triboelectrically active with each other whereby said electrically conductive toner particles triboelectrically impart a charge of a selected polarity to said insulating toner particles, said insulating toner particles being present in an amount from about 20 percent to about 70 percent by weight of said toner composition and having a powder resisitivity greater than about 10^{11} ohm-cm and said conductive toner particles being present in an amount from about 80 percent to about 30 percent by weight of said toner composition and having a powder resisitivity of from about 10^4 ohm-cm to about 10^{10} ohm-cm, each of said insulating toner particles and said conductive toner particles having a particle size range of from about 1 micron to about 40 microns, whereby both said insulating toner particles and said conductive toner particles develop onto said surface in conformance with said electrostatic latent image to form a toner image, electrostatically transferring said toner image to a receiving member, and fixing said toner image to said receiving member.

4,457,997

TWO-COMPONENT DIAZOTYPE MATERIAL

Klaus Thoese; Hans-Dieter Frommeld, and Siegfried Scheler, all of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 5, 1982, Ser. No. 337,277

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1981, 3100579

Int. Cl.³ G03C *1/54*

U.S. Cl. 430—160 **7 Claims**

1. A two-component diazotype material, comprising: a support comprising a biaxially oriented polyester film; and a light-sensitive layer which is applied to said support and comprises a polymeric binder, a diazonium salt, a coupler, and an acid stabilizer, wherein the polymeric binder comprises a mixture of from about 10 to 60 percent by weight of a copolymer of vinyl acetate and crotonic acid and from about 90–40 percent by weight of a cellulose ester selected from the group of cellulose acetopropionate, cellulose acetobutyrate, cellulose propionate and cellulose butyrate.

4,457,998

COMPOSITION WITH UNCROSSLINKED POLYMER CONTAINED IN A CROSSLINKED POLYMER NETWORK

Robert J. Gruber, Pittsford; Steven B. Bolte, Rochester; Bernard Grushkin, Pittsford, and Ronald J. Koch, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 8, 1982, Ser. No. 346,471

Int. Cl.³ G03G *5/00, 9/08;* H05B *3/10;* B05D *1/06*

U.S. Cl. 430—98 **18 Claims**

1. An improved developer composition comprised of resin particles, pigment particles, and carrier particles, wherein the resin particles are comprised of from about 10 percent by weight to about 90 percent by weight of an uncrosslinked polymer selected from styrene/alkylacrylate polymers, styrene butadiene polymers, polyethers, polyesters, polyamides, and copolycarbonates, which uncrosslinked polymer is contained in a highly crosslinked polymer network which highly crosslinked polymer network has been crosslinked in the presence of the uncrosslinked polymer, the crosslinked polymer network being selected from polymeric anhydrides, epoxies, poly(styrene-co-hydroxy proply methacrylate), and poly(styrene-co-allyl alcohol) polymers.

4,457,999

LIGHT-SENSITIVE 1,2 QUINONE DIAZIDE CONTAINING MIXTURE AND LIGHT-SENSITIVE COPYING MATERIAL PREPARED THEREFROM WHEREIN IMAGED PRODUCED THEREIN IS VISIBLE UNDER YELLOW SAFETY LIGHT

Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,387

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1981, 3144499

Int. Cl.³ G03C *1/60, 1/54, 1/72*

U.S. Cl. 430—191 **9 Claims**

1. A light-sensitive mixture, comprising:

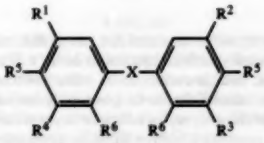
(a) a 1,2-quinonediazide of a mixture of

(a^1) a compound forming an acid on exposure and

(a^2) a compound having at least one C—O—C bond cleavable by acid;

(b) a water-insoluble binder soluble in aqueous-alkaline solution;

(c) an organic compound forming an acid on exposure comprising an ester of the formula I



wherein

X is a single bond or one of the groups CO, SO_2, N=N or CR^7R^8,

R^1, R^2, R^3 and R^4 are hydrogen atoms, halogen atoms or nitro groups, with not more than two of these groups being hydrogen atoms and at least one thereof being a nitro group,

R^5 and R^6 are hydrogen atoms or 1,2-naphthoquinone-2-diazide-4-sulfonyloxy radicals, with R^5 and R^6 being always different from each other, and

R^7 and R^8 are hydrogen atoms or lower alkyl radicals, and

(d) a dyestuff comprising an azo dyestuff containing at least one nitro group in the molecule,

said ingredients a, b, c, and d being present in such amounts that said mixture produces after imagewise exposure thereof an image of an original which is clearly visible under yellow safety light.

4,458,000

LIGHT-SENSITIVE MIXTURE AND LIGHT-SENSITIVE COPYING MATERIAL PREPARED THEREFROM WHEREIN IMAGE PRODUCED THEREIN IS VISIBLE UNDER YELLOW SAFETY LIGHT

Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,388

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1981, 3144480

Int. Cl.³ G03C *1/60, 1/54, 1/727*

U.S. Cl. 430—191 **11 Claims**

1. A light-sensitive mixture, comprising:

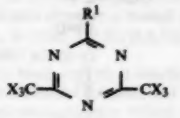
(a) a 1,2-quinonediazide or a mixture of

(a^1) a compound forming an acid on exposure and

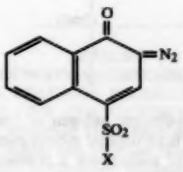
(a^2) a compound having at least one C—O—C bond cleavable by acid;

(b) a water-insoluble binder soluble in aqueous-alkaline solution;

(c) a photolytically cleavable organic halogen compound of one of the formulae I and II



I



II

in which

R^1 denotes an aromatic radical bonded directly or via a conjugated chain, and

X denotes a halogen atom; and

(d) a dyestuff comprising an azo dyestuff containing at least one nitro group in the molecule, said ingredients a, b, c, and d being present in such amounts that said mixture produces after imagewise exposure thereof an image of an original which is clearly visible under yellow safety light.

4,458,001

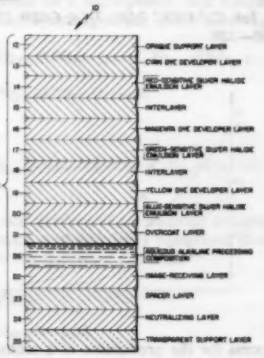
β-ELIMINATING POLYMERS FOR DIFFUSION CONTROL IN PHOTOGRAPHIC PRODUCTS

Lloyd D. Taylor, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 29, 1982, Ser. No. 454,448

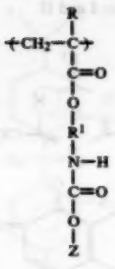
Int. Cl.³ G03C *5/54, 1/40, 7/20*

U.S. Cl. 430—215 **51 Claims**



48. An integral negative-positive diffusion transfer film unit comprising:

a photosensitive laminate comprising a composite structure containing, in sequence, an opaque support layer, a negative component comprising at least one photosensitive silver halide emulsion layer having associated therewith an image dye-providing material, a positive component comprising an image-receiving layer dyeable by the image dye-providing material, and a transparent support layer, the photosensitive laminate also comprising a diffusion control layer containing a polymer comprising recurring units of the formula



wherein R is hydrogen, halogen or lower alkyl; R^1 is alkylene; and Z is an organic moiety capable under alkaline conditions of undergoing a β-elimination reaction, said moiety containing at least two interbonded carbon atoms, one of the carbon atoms containing an acid-labile proton capable of abstraction under said alkaline conditions and an activating group effective to activate said β-elimination reaction;

means retaining an aqueous alkaline processing composition integrated with the film unit so that the processing composition can be distributed between the negative and positive components.

4,458,002

METHOD AND MATERIALS FOR IMPROVING THE COLOR BALANCE OF PHOTOGRAPHIC MULTICOLOR IMAGES USING CONTACT SCREEN

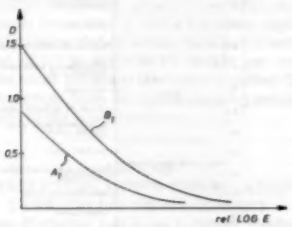
Wilhelmus Janssens, Aarschot; Christiaan G. Thiers, Schoten, and Wilfried F. Liekens, Brasschaat, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed May 17, 1983, Ser. No. 495,254

Claims priority, application United Kingdom, Jun. 30, 1982, 8218933

Int. Cl.³ G03C *7/00, 7/04;* G03B *27/72*

U.S. Cl. 430—236 **11 Claims**



1. A process for the production of a multicolour reversal image with improved colour balance which process comprises the steps of directing incident image light dot- or linewise modulated by a contact screen onto a multicolour photographic silver halide emulsion material containing a blue-, a green- and a red-sensitive silver halide emulsion layer and processing said silver halide emulsion layers to form a colour reversal image, characterized in that in the maximum density part of the dots or lines of said contact screen the ratio of the absorption density for the light corresponding with the spectral sensitivity region of the silver halide emulsion layer which during the exposure is most remote from the contact screen to the absorption density for the light of the whole visible spectrum (400–700 nm) is higher than the said ratio in any other density part of the dots or lines.

4,458,003

PHOTOSENSITIVE MATERIALS FOR USE IN MAKING DRY TRANSFERS

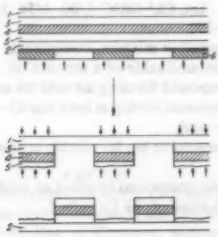
John V. Shepherd, and John S. Thornley, both of Ashford, England, assignors to Esselte Pendaflex Corp., Garden City, N.Y.

Filed Jun. 1, 1983, Ser. No. 499,806

Claims priority, application United Kingdom, Jun. 7, 1982, 8216503

Int. Cl.³ G03C *1/71, 1/68;* G03F *1/02*

U.S. Cl. 430—253 **8 Claims**



1. A photosensitive material for use in the making of dry transfer material which comprises in order a first transparent or translucent, flexible carrier sheet, a first photosensitive layer which is photocrosslinkable or photopolymerisable, a shearable image-forming layer, an adhesive layer which is a permanently tacky pressure-sensitive adhesive composition or which is capable of becoming a permanently tacky pressure-sensitive adhesive composition on exposure to light, and, adjacent the adhesive layer, a second flexible carrier sheet, which second carrier sheet is transparent or translucent at least when the adhesive layer is photosensitive, the ease with which the first photosensitive layer may be removed from the first carrier sheet being increased under the action of actinic radiation.

4,458,004

OPTICAL INFORMATION RECORDING MEDIUM

Kiyoshi Tanikawa, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 422,414

Claims priority, application Japan, Oct. 1, 1981, 56-154842

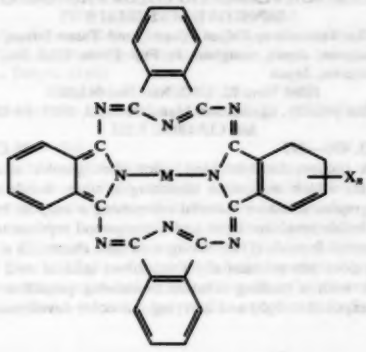
Int. Cl.³ G03C *1/78*

U.S. Cl. 430—270 **12 Claims**

1. An optical information recording medium capable of recording optical information thereon by application of high density energy beams thereto, the recorded information being thereafter reproducible therefrom, comprising:

a transparent base; and

a recording layer on said base so that high density energy beams can be transmitted through said base and applied to said recording layer, said recording layer comprising a fluorophthalocyanine compound of the following formula and capable of absorbing light having a wave length of 700 nm or more:



wherein M is a member selected from the group consisting of hydrogen, a metal, a metal oxide and a metal halide, X is fluorine, and n is an integer from 1 to 16.

4,458,005

POLYVINYLMETHYLPHOSPHINIC ACID, PROCESS FOR ITS MANUFACTURE AND USE

Dieter Mohr, Wiesbaden; Walter Herwig, Bad Soden; Werner Frass, and Gerhard Usbeck, both of Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 23, 1982, Ser. No. 391,132

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1981, 3126627

Int. Cl.³ C08F *130/02*

U.S. Cl. 430—271 **11 Claims**

1. A polymer material comprised of polyvinylmethylphosphinic acid.

4,458,006

PHOTOPOLYMERIZABLE MIXTURE AND PHOTOPOLYMERIZABLE COPYING MATERIAL PREPARED THEREWITH

Reinhard Döenges, Bad Soden, and Klaus Horn, Hofheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 14, 1983, Ser. No. 504,136

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1982, 3223104

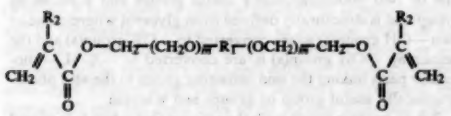
Int. Cl.³ G03C *1/68, 1/74*

U.S. Cl. 430—283 **7 Claims**

1. A mixture which is polymerizable by radiation, comprising:

(a) a polymerizable compound having terminal acrylic or methacrylic acid ester groups and being selected from a compound of the formula I

(I)



wherein

R_1 is a naphthylene group, a biphenyldiyl group or a dinaphthylmethanediyl group or a group formed by two phenylene groups which are linked by a bridge comprised of an oxygen atom, a sulphur atom, a sulfone group or an alkylene group which is substituted by at least one carboxylic acid group, carboxylic acid alkyl ester groups, halogen atom or phenyl group, or by such a substituted alkylene group which is connected to the group R^1 of another molecule via said substituent;

R_2 is a hydrogen atom or a methyl group; and

m is 0 or 1, m being 1 if R_1 is a naphthylene group or a biphenyldiyl group;

(b) a polymeric binder which is soluble or at least swellable in an aqueous-alkaline solution; and

(c) a polymerization initiator which can be activated by radiation.

4,458,007

RADIATION POLYMERIZABLE MIXTURE CONTAINING REACTION PRODUCTS OF GLYCEROL ACRYLATES AND POLYISOCYANATES

Ulrich Geissler, Frankfurt; Heide Sprengel, Wiesbaden; Walter Herwig, Bad Soden, and Manfred Hasenjaeger, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 15, 1981, Ser. No. 330,888

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048502

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—284 **9 Claims**

1. A radiation-polymerizable mixture consisting essentially of:

(a) from about 20 to 80 weight percent of a polymeric binder soluble in aqueous solutions;

(b) from about 0.1 to 20 weight percent of a radiation-activatable polymerization initiator; and

(c) from about 20 to 80 weight percent of an acrylate or methacrylate ester of a polyhydric hydroxy compound having at least two urethane groups in the molecule;

said ester being a reaction product of glycerol dimethacrylate or glycerol diacrylate and a polyisocyanate; said polyisocyanate being

(i) a diisocyanate;

(ii) a reaction product of 1 mole of a trihydroxy compound and 3 moles of a diisocyanate, said trihydroxy compound corresponding to one of the following formulas:

$$HO-[C_pH_{2p-r}(OH)_rS-]_{m-1}C_pH_{2p-r}(OH)_{r-1},$$

$$HO-[C_pH_{2p-r}(CH)_r-O-]_mH,$$

and

$$HO-C_sH_{2s-r}(OH)_r-Z(-CO-C_qH_{2q}-O)_m-H;$$

or

(iii) a reaction product of a dihydroxy compound with a diisocyanate, said dihydroxy compound corresponding to one of the following formulas:

$$HO-[C_pH_{2p}-S-]_{m-1}C_pH_{2p}(OH),$$

$$HO-[C_pH_{2p}-O-]_mH,$$

$$HO-C_sH_{2s}-Z(-CO-C_qH_{2q}-O)_m-H,$$

and

$$HO+C_pH_{2p}-O\rightarrow_n\langle\rangle-R''-\langle\rangle-O+C_pH_{2p}-O\rightarrow_nH,$$

in which formulas for both of said trihydroxy compound and said dihydroxy compound, respectively:

R'' represents O, S, CR_2 or SO_2,

R represents a hydrogen atom or a methyl group,

Z represents O or NR,

n represents an integer from 0 to 20,

m represents an integer from 1 to 40,
p represents an integer from 2 to 20,
q represents an integer from 2 to 10,
s represents an integer from 2 to 10, and
v is 0 or 1,
p, q, and s each being at least 2 greater than v.

4,458,008

PHOTOGRAPHIC SYSTEM AND PHOTOGRAPHIC MATERIAL FOR USE THEREIN

Ivan T. Konstantinov; Borislav D. Mednikarov; Maria A. Sahatchieva, and Atanas T. Burov, all of Sofia, Bulgaria, assignors to Zlafop pri Ban, Sofia, Bulgaria

Division of Ser. No. 240,988, Mar. 5, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 452,934
Claims priority, application Bulgaria, Feb. 15, 1980, 46640
Int. Cl.³ G03C 1/495, 1/72; G03F 7/10
U.S. Cl. 430—302 14 Claims

1. A process for the production of a photographic material for use in photolithography, which comprises exposing imagewise to radiation a material which comprises a carrier base and, on the carrier base, a thin homogeneous or emulsion layer of at least one photosensitive substance selected from chalcogenides of phosphorus, arsenic, germanium and metals, which photosensitive substance is capable, upon exposure to radiation, of exhibiting photoselective capacity for dissolution in an alkaline developer, the photosensitive substance being either unreactive with the carrier base when exposed to radiation or reactive with the carrier base when exposed to radiation and isolated from the carrier base by interposition between the said layer and the carrier base of an intermediate layer having adhesive and/or insulating and/or hydrophilic properties and which does not react with the photosensitive substance when the latter is exposed to radiation, and subjecting the exposed photographic material to alkaline development using an alkaline developer containing dissolved therein at least one organic compound selected from dyestuffs having the capacity for dyeing tannined cotton and dyestuffs having the capacity for dyeing synthetic fibres.

4,458,009

PROCESS FOR THE PRODUCTION OF COLOR PHOTOGRAPHIC IMAGES AND PHOTOGRAPHIC RECORDING MATERIALS

Edith Weyde, Kuerten; Wilhelm Saleck, Bergisch Gladbach; Hubertus Psaar, Leverkusen; Anita von König, Krefeld, and Hans Öhlschläger, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 10, 1983, Ser. No. 456,971
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1982, 3201557
Int. Cl.³ G03C 5/16
U.S. Cl. 430—350 17 Claims

1. A process for the production of positive coloured photographic images by exposing imagewise a photographic material comprising a photosensitive layer containing a photosensitive compound which, as a result of exposure and heat treatment or conventional photographic development, forms nuclei for the imagewise decomposition of hydrogen peroxide, wherein the exposed material containing nuclei for the decomposition of hydrogen peroxide in imagewise distribution is treated with hydrogen peroxide gas and heated in the presence of an oxidisable dye present in the photosensitive layer or in an adjacent or separate layer, the dye being destroyed imagewise over those areas corresponding to the unexposed parts of the photosensitive layer.

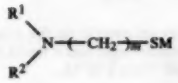
4,458,010

PROCESS FOR BLEACHING COLOR PHOTOGRAPHIC SENSITIVE MATERIALS

Kiyohiko Yamamuro; Shigeo Hirano, and Yasuo Iwasa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

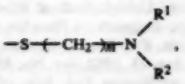
Filed Nov. 12, 1982, Ser. No. 441,207
Claims priority, application Japan, Nov. 13, 1981, 56-181994
Int. Cl.³ G03C 7/00
U.S. Cl. 430—393 18 Claims

1. A process for bleaching color photographic sensitive materials which comprises bleaching a silver halide color photographic sensitive material comprising a support base, a silver halide emulsion layer and a compound represented by the general formula (I) or strong acid salts thereof in a layer which does not substantially form silver salts of said compounds with a treating solution containing persulfate after being exposed to light and carrying out color development:



(I)

wherein M represents a hydrogen atom, an alkali metal atom, an alkaline earth metal, a quaternary ammonium group, a quaternary phosphonium group, an amidino group



R^1 and R^2 each represents a hydrogen atom or an aliphatic group, and m represents an integer of 2 to 4.

4,458,011

BALLASTED COMPOUNDS AND PHOTOGRAPHIC ELEMENTS CONTAINING SUCH COMPOUNDS

Christian C. Van de Sande, Beisele; Jan J. Vandewalle; Marcel J. Monbaliu, both of Mortsel, and Raphaël K. Van Poucke, Berchem, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Oct. 29, 1982, Ser. No. 437,861
Claims priority, application United Kingdom, Nov. 12, 1981, 8134157
Int. Cl.³ G03C 7/26
U.S. Cl. 430—543 5 Claims

1. A photographic element comprising one or more light-sensitive silver halide emulsion layers and in one or more hydrophilic colloid layers at least one compound comprising one or two photographically useful groups and a ballasting group that is structurally derived from glycerol wherein one or two —OH group(s) is/are converted to —OR group(s) and the remaining —OH group(s) is/are converted to —X—L— molecular parts linking the said ballasting group to the said photographically useful group or groups and wherein:

R is an organic group with the proviso that when two of said —OR group are present, the said —R groups together contain not less than 5 hydrocarbon C-atoms;

X is —O—, —S— or —NY—, where Y is H or a C_1–C_5 alkyl group, and

L is a chemical bond or a group linking X to the said photographically useful group or groups.

4,458,012

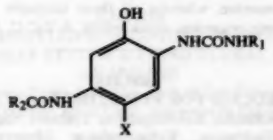
LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Kenji Ito; Satoru Shimba; Yasuo Tsuda, and Hiroshi Sugita, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

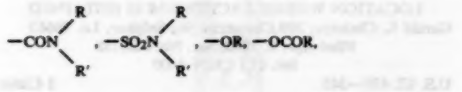
Filed Feb. 22, 1983, Ser. No. 468,408
Claims priority, application Japan, Feb. 25, 1982, 57-30390
Int. Cl.³ G03C 7/26
U.S. Cl. 430—549 17 Claims

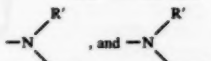
1. A light-sensitive silver halide color photographic material having at least one light-sensitive silver halide emulsion layer on a support, characterized in that said light-sensitive silver halide emulsion layer contains a cyan coupler represented by formula [I] shown below, and wherein at least one layer selected from said light-sensitive silver halide emulsion layer and a layer contiguous to said light-sensitive silver halide emulsion layer contains a colored cyan coupler represented by formula [II]:

Formula [I]:



wherein x represents a hydrogen atom or a group capable of being eliminated by a coupling reaction with an oxidized product of an aromatic primary amine color developing agent; R_1 represents a naphthyl group or a heterocyclic group (provided that a carbon atom of said heterocyclic group is bonded to the ureido group), or a phenyl group having at least one substituent (with the proviso that when one of said substituents is cyano at the p-position of said phenyl group relative to the ureido group, the four ortho and meta positions of said phenyl group relative to the ureido group cannot have hydrogen atoms at the same time) selected from the group consisting of trifluoromethyl, nitro, cyano, —COR, —COOR, $—SO_2R$, $—SO_2OR$,

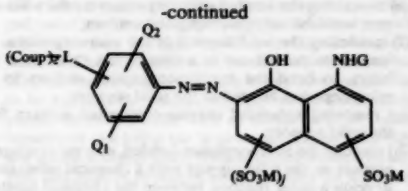




(wherein R represents an aliphatic group or an aromatic group, and R′ represents a hydrogen atom, an aliphatic group or an aromatic group); and R_2 represents an aliphatic group or an aromatic group necessary to impart diffusion resistance to the cyan dyes formed from the cyan couplers represented by formula [I] and the cyan dyes to be formed from said cyan coupler,

Formula [II]:

-continued



wherein (Coup—)$_c$ represents a cyan coupler residue; L represents a divalent linking group connecting the cyan coupler residue to the dye structure moiety; Q_1 and Q_2 each represent photographically inactive mono-valent groups; M represents a cation or a hydrogen atom; j is an integer of 0 or 1; and G represents an acyl group or an alkylsulfonyl group having 1 to 8 carbon atoms or an arylsulfonyl group having 6 to 8 carbon atoms.

4,458,013

METHOD FOR THE IMMUNOASSAY OF ELASTASE-1 AND A SET OF REAGENTS FOR SUCH IMMUNOASSAY

Toshiro Ooyama, Tokyo, Japan, assignor to Dainabot Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 28,354, Apr. 9, 1979, abandoned. This application May 26, 1981, Ser. No. 267,396
Claims priority, application Japan, Jul. 5, 1978, 53-81651
Int. Cl.³ G01N 33/50; C12Q 1/38; C12N 9/99
U.S. Cl. 435—7 13 Claims

1. A method for the immunoassay of elastase-1 comprising the steps of: subjecting a sample containing immunologically active enzymatically inactive elastase-1 to be measured and a given quantity of standard immunologically active enzymatically inactive labelled antigen elastase-1, both having been previously reacted with a synthetic elastase inhibitor selected from the group consisting of diisopropyl fluorophosphate, phenylmethanesulfonyl fluoride, and p-chloromercuribenzoates to prevent the enzymatic activity of elastase-1, to a competitive reaction with an anti-elastase-1 antibody; separating the antibody-bound labelled antigen elastase-1 and the free labelled antigen elastase-1 from the reaction mixture; measuring the activity of the labelling agent in either or both of the fractions; and comparing the quantity of the elastase-1 in the sample with standard values to determine the amount of elastase-1 in said sample to be measured.

4,458,014

SEROLOGICAL METHOD FOR THE IDENTIFICATION OF MICROORGANISMS

Jeffrey L. Ebersole, Westboro, Mass., assignor to Forsyth Dental Infirmary for Children, Boston, Mass.

Filed Jan. 11, 1982, Ser. No. 338,644
Int. Cl.³ G01N 33/54; C12Q 1/04; C12N 11/06; C07G 7/00
U.S. Cl. 435—7 27 Claims

1. A method for the serological identification of microorganisms, which method comprises:

(a) injecting a warm-blooded mammal with a killed microorganism in an immunization regimen of only a first and a second injection, the second injection given within about 14 to 21 days after the first injection, each injection containing about 10^9 killed microorganisms, to elicit antibodies in the serum of the mammal that are specific to the immunodeterminants of the microorganism;

(b) recovering from the mammal in about 14 to 21 days after the second injection a microorganism-specific antisera without need for extensive cross adsorption of the sera;

(c) securing separately a known and unknown microorganism to a solid support by bonding the respective microorganisms to the solid support in the presence of a fixative;

(d) conjugating the specific antisera with an enzyme marker material to provide enzyme-conjugated antisera;

(e) contacting the bonded microorganisms on the solid support with the enzyme-conjugated antisera;
(f) incubating the solid support of the microorganisms, the incubation carried out in a time of less than about two hours, to bond the enzyme-conjugated antisera to the microorganism bonded to the solid support;
(g) removing unbonded enzyme-conjugated antisera from the solid support;
(h) reacting the microorganism-bonded, enzyme-conjugated antisera on the solid support with a chemical substrate, to develop a color reaction between the chemical substrate and the enzyme-conjugated antisera; and
(i) identifying the unknown microorganism by observing the nature of the color activity in comparison to the color activity of the reaction with the known microorganism.

4,458,015

REAGENT FOR THE OPTICAL DETERMINATION OF THE BLOOD COAGULATION

Helmut Jering; Udo Becker, both of Munich, and Peter Roeschlau, Seeshaupt, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Mar. 19, 1982, Ser. No. 360,099
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1981, 3113350
Int. Cl.³ C12Q *1/56*; C12N *9/99*
U.S. Cl. 435—13 **8 Claims**

1. Reagent for the optical determination of blood coagulation behavior (Quick test), comprising thromboplastin, a synthetic thrombin substrate and a buffer in the range of pH 7.2 to 8.5, said thromboplastin being non-proteolytically-active so as to develop only about 22.7 to 35.7% of the extinction at 405 nm as compared with normal thromboplastin when each is incubated for a period of one to seven days at about 20° C. with tris-HCl buffer of pH 8.1 in the presence of chromogeneous substrate.

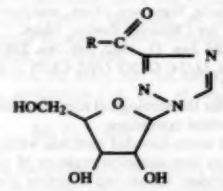
4,458,016

PRODUCTION OF 1-β-D-RIBOFURANOSYL-1,2,4-TRIAZOLE

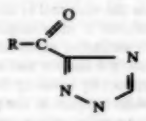
Shigeru Yamanaka, Yokohama; Takashi Utagawa, Kawasaki, and Tadao Kobayashi, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Mar. 9, 1982, Ser. No. 356,405
Claims priority, application Japan, Mar. 9, 1981, 56-33304
Int. Cl.³ C12P *19/28, 17/16, 17/10, 17/04*
U.S. Cl. 435—85 **4 Claims**

1. A method for producing a 1-β-D-ribofuranosyl-1,2,4-triazole of the formula:



wherein R is hydroxy, amino, or alkoxy, which comprises: reacting a 1,2,4 triazole of the formula:



wherein R is hydroxy, amino, or alkoxy, with a greater than equimolar amount of a ribofuranosyl group donor selected from the group consisting of ribose-1-phosphate, purine nucleosides, purine nucleotides, pyrimidine nucleosides, and pyrimidine nucleotides in the presence of a nucleoside phosphorylase preparation at a temperature in the range from 55° to 65° C. for a period from 10 minutes, to 20 hours, and

recovering said 1-β-ribofuranosyl-1,2,4-triazole from the reaction mixture.

4,458,017

PROCESS FOR PREPARING FRUCTOSE FROM STARCH

Robert O. Horwath, Westport, and Robert M. Irbe, Norwalk, both of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 30, 1982, Ser. No. 393,589
Int. Cl.³ C12P *19/24, 19/20, 19/14*; C12N *9/92*; C12R *1/645*
U.S. Cl. 435—94 **4 Claims**

1. The process for preparing fructose which comprises liquefying starch by contacting starch with alpha-amylase contacting the resulting liquefied starch with glucoamylase to hydrolyze said starch to glucose, and isomerising at least part of the resulting glucose to fructose by contacting said glucose with glucose isomerase, wherein all three enzymes are obtained from the same organism, *Irpex mollis*, A.T.C.C. No. 20634.

4,458,018

PROCESS FOR PURIFYING ELASTASE

Tsunehiko Katsoka, Kakamigahara; Yoshiaki Nagara, Hajima; Akira Hashimoto, Kakamigahara; Masayuki Konishi, Ichinomiya, and Koichi Ogawa, Inazawa, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1982, Ser. No. 446,079
Claims priority, application Japan, Dec. 15, 1981, 56-200856
Int. Cl.³ C12N *9/66*
U.S. Cl. 435—218 **10 Claims**

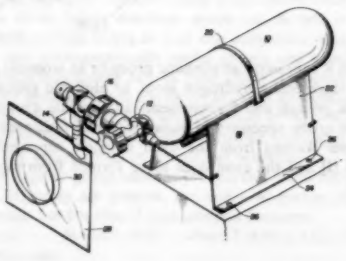
1. A process for purifying elastase which comprises treating a starting aqueous solution of crude elastase to obtain a modified aqueous solution having an electroconductivity of not greater than 3 millimhos per centimeter and a pH of from 2 to 5, and then precipitating elastase from said modified aqueous solution.

4,458,019

PORTABLE SYSTEM FOR ISOLATING AND CULTURING BACTERIUM AND DISPENSING A GASEOUS MIXTURE INTO CULTURE BAG AT LOCATION WHERE BACTERIUM IS OBTAINED

Gerald L. Chrisope, 309 Comanche St., Sulphur, La. 70663

Filed Apr. 5, 1982, Ser. No. 365,738
Int. Cl.³ C12N *1/00*
U.S. Cl. 435—243 **1 Claim**



1. A method of obtaining a culture of microorganisms and

transporting said culture in a gaseous environment to an incubator station comprising:

transporting a bacti gas kit containing a small gas cylinder containing a desired gaseous mixture, a plurality of sealable plastic bags, a plurality of culture media and a normally closed semi-rigid nozzle means for injecting said gaseous mixture into a sealable bag,

obtaining a specimen of microorganisms,

placing said specimen on a culture media,

placing said culture media into a sealable plastic bag,

partially closing the sealing bag,

inserting one end of said normally closed semi-rigid nozzle means into said partially closed sealing bag,

bending said nozzle means to permit gas flow thereby injecting said gaseous mixture into said sealable plastic bag containing said culture media,

removing said nozzle means from said sealing bag,

squeezing the plastic bag to squeeze out the gaseous mixture,

again inserting said nozzle means into said partially closed sealing bag, bending said nozzle means and

injecting said gaseous mixture into said bag thereby filling said bag with said gaseous mixture,

sealing the bag, and

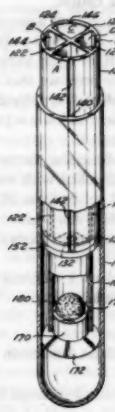
transporting the bag to an incubator.

4,458,020

INTEGRATED SINGLE TUBE PLUNGER IMMUNOASSAY SYSTEM HAVING PLURAL REAGENT CHAMBERS

Joseph W. Bohn; Peter A. Cohen, both of San Diego, and Bruce L. Zuraw, Del Mar, all of Calif., assignors to Quidel, La Jolla, Calif.

Filed Nov. 15, 1982, Ser. No. 441,605
Int. Cl.³ G01N *33/54, 33/58*
U.S. Cl. 435—296 **7 Claims**



1. An immunoassay apparatus comprising:

a cylindrical container tube having an open end and a closed end; and

a plunger filter assembly received in the open end of the container tube and being slidable in the container tube the plunger filter assembly comprising means forming a reaction chamber open at the proximal end, a movable seal secured at the proximal end of the reaction chamber, closure means substantially closing the distal end of the reaction chamber and forming an off-center port therethrough, the seal in said proximal end being movable with respect to the interior walls of the container tube and forming a substantially fluid tight movable seal between the proximal end of the plunger filter and the container tube, a dome-shaped filter inside and closing the proximal end of the reaction chamber to the passage of material in and out of said proximal end except for fluids and particles which can pass through the filter, and immunologically reactive beads in said raction chamber which, in use, bind selected immunologically active constituents, of the fluid to be assayed, the immunologically active beads having porous surfaces treated with an immunologically active constituent and being too large to pass through the filter, and means forming plural reagent chambers secured adjacent said closure to said reaction chamber for movement relative to said closure, said chamber forming means forming a proximal end having a port therethrough and means for selectively aligning the respective ports in said reagent chambers with the port in the closure to the reaction chamber for fluid communication therebetween.

4,458,021

BLOOD GAS CONTROL

Kathryn D. Herring, Miami, Fla., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed May 3, 1982, Ser. No. 373,938
Int. Cl.³ C09K *3/00;* G01N *33/50, 33/96*
U.S. Cl. 436—11 **9 Claims**

1. A blood gas control for quality control measurement of pH and one or more blood gases comprising:

in a sealed receptacle, impermeable to gas exchange with the ambient environment, an aqueous, essentially cell-free, stable blood gas control fluid consisting essentially of having an isolation effective amount of a non-primate proteinaceous foaming agent, an assigned concentration of dissolved carbon dioxide and dissolved oxygen, a buffer, and a gaseous head space, the amount of foaming agent in said fluid being (i) insufficient to adversely effect the shelf life of the control in the sealed receptacle, (ii) capable, upon agitation of the sealed receptacle, of forming a gas impermeable foam barrier which effectively isolates the control fluid from the ambient environment upon opening of said receptacle, and (iii) approximate the concentration of protein in human serum, thereby maintaining, for a finite interval, the level of dissolved gas in said control fluid at essentially its assigned value.

6. An essentially cell-free, stable blood gas control fluid consisting essentially of a buffer, an assigned concentration of dissolved carbon dioxide, dissolved oxygen, and an isolation effective amount of a non-primate proteinaceous foaming agent, the concentration of said foaming agent being in the range of from about 5 to about 7 grams perdeciliter so as to approximate the amount of protein present in human blood and the concentration of dissolved carbon dioxide and dissolved oxygen being at levels assigned relative to the function of the control fluid.

4,458,022

PROCESS FOR MANUFACTURING MOLECULAR SIEVING CARBON

Takushi Ohsaki, and Susumu Abe, both of Bizen, Japan, assignors to Kuraray Chemical Co., Ltd., Bizen, Japan

Filed May 17, 1983, Ser. No. 495,488
Claims priority, application Japan, Jun. 7, 1982, 57-97276
Int. Cl.³ B01J *21/20, 21/18;* C01B *31/08*
U.S. Cl. 502—42 **8 Claims**

1. A process for manufacturing molecular sieving carbon comprising the steps of:

(a) adding coal tar pitch, coal tar, or a combination thereof to powdered coconut shell charcoal as a binder,

(b) pelletizing said mixture and carbonizing the same at about 750° C.–900° C.,

(c) immersing the pellets in a dilute mineral acid solution,

(d) drying the adequately washed pellets,

(e) adding about 1–3% coal tar pitch, coal tar, or a combination thereof to the pellets,

(f) heating the pellets to about 200° C.–400° C.,

(g) heating the pellets to about 950° C.–1000° C. for about 10–60 minutes, and

(h) cooling the pellets in an inert gas.

2. A process for manufacturing molecular sieving carbon according to claim 1 wherein the rate of temperature increase between steps (f) and (g) of claim 1 is held substantially constant.

3. A process for manufacturing molecular sieving carbon according to claim 1 wherein the heat treatment described in step (g) of claim 1 is between about 950° C. and 970° C.

4,458,023

CATALYST MANUFACTURE

William A. Welsh, Fulton; Mark A. Seese, Ellicott City, and Alan W. Peters, Rockville, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 291,178, Aug. 10, 1981, abandoned. This application Nov. 2, 1982, Ser. No. 438,599

Int. Cl.³ B01J *29/06*

U.S. Cl. 502—65 **28 Claims**

1. In a process for preparing catalyst compositions wherein (a) a zeolite is mixed with an aluminum chlorhydrol binder, (b) the mixture is formed into particles, and (c) the particles are calcined to obtain hard, attrition resistant catalysts, the improvement comprising;

combining a zeolite which contains in excess of about one percent by weight alkali metal oxide with the chlorhydrol, calcining the particles at a temperature of about 300° to 600° C., and ion exchanging and washing the formed calcined particles to obtain a catalyst containing less than about one percent by weight alkali metal oxide.

3. The method of claim 1 wherein said aluminum chlorhydrol has the formula $Al_{2+m}(OH)_{3m}Cl_6$ wherein m has a value of about 4 to 12.

5. The method of claim 1 wherein said aqueous mixture prepared in step (a) includes clay.

4,458,024

PROCESS FOR HYDROTREATING PETROLEUM RESIDUA AND CATALYST THEREFOR

Stephen M. Oleck, Moorestown, and Robert C. Wilson, Jr., Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,439

Int. Cl.³ B01J *29/30*

U.S. Cl. 502—66 **8 Claims**

1. A catalyst composition consisting essentially of 10–30 wt. % of a ZSM-5 type zeolite, 90–70 wt. % of alumina, based on alumina plus zeolite, and 10–25 wt. %, based on total catalyst and expressed as oxides, of at least one Group VIII metal selected from the group consisting of nickel, cobalt and iron, and at least one Group VIB metal, said catalyst having about 80% of its pore volume in pores no greater than 100 Angstrom units in diameter and at least 90% of its pore volume in pores no greater than 150 Angstrom units in diameter.

4,458,025

METHOD OF ZEOLITIC CATALYST MANUFACTURE

Bowman Lee, El Cerrito, and Donald S. Santilli, Pinole, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 20, 1982, Ser. No. 420,532

Int. Cl.³ B01J *29/10*

U.S. Cl. 502—66 **11 Claims**

1. A method of forming a catalyst comprising:

(a) forming a non-acidic alumina sol;

(b) mulling said alumina sol with a zeolite to form a mixture;

(c) extruding said mixture to form an extrudate;

(d) drying said extrudate;

(e) calcining said dried extrudate;

(f) impregnating said calcined extrudate with a Group VIII metal to form a catalyst;

(g) drying said catalyst; and

(h) calcining said dried catalyst.

2. A method of forming a catalyst according to claim 1 wherein said non-acidic alumina sol is formed by peptizing an alumina, back-neutralizing said peptized alumina sol and washing said sol.

5. A method of forming a catalyst according to claim 2 wherein said alumina sol is back-neutralized with potassium hydroxide.

4,458,026

CATALYSTS FOR ALDOL CONDENSATIONS

Walter T. Reichle, Warren, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 384,212, Jun. 2, 1982. This application May 25, 1983, Ser. No. 498,146

Int. Cl.³ B01J *21/16*

U.S. Cl. 502—80 **17 Claims**

1. Method of preparing aldol condensation catalysts which comprises the steps of:

(1) Adding mixed aqueous solutions of divalent and trivalent inorganic salts to a solution of a stoichiometric amount of sodium hydroxide and sodium carbonate at ambient temperature with vigorous stirring whereby a slurry is obtained;

(2) Heating the slurry from (1) at about 60°–200° C. until crystallization occurs providing a synthetic anionic clay mineral having the generic formula:

$$M_mN_n(OH)_{(2m+2n)}A_a \cdot bH_2O$$

wherein

M is a divalent metal cation;

N is a trivalent metal cation;

A is a mono- , di- or trivalent anion which decomposes at about 300°–500° C. to form a volatile gas;

m and n are such that m/n has values of 1 to about 6;

a is a number with the provisos that when A is a monovalent anion, a=n, when A is a divalent anion, a=½n, and when A is a trivalent anion a=⅓n, and b is an integer having values of 1 to 10;

(3) Filtering the solids from the slurry in (2);

(4) Washing the filtered solids with water;

(5) Heating the filtered solids from (4) to a temperature of about 300° to about 600° C.; and

(6) Recovering the heated solids from (5) as an aldol condensation catalyst.

2. Method claimed in claim 1 wherein the synthetic anionic clay mineral has the formula:

$$M_6N_2(OH)_{16}A \cdot 4H_2O.$$

3. Method claimed in claim 2 wherein M is Mg^{+2} and A is CO_3^{-2}.

4. Method claimed in claim 2 wherein M is Ni^{+2}, N is Cr^{+3}, and A is CO_3^{-2}.

5. Method claimed in claim 2 wherein M is a mixture of Ni^{+2} and Mg^{+2}, N is Al^{+3} and A is CO_3^{-2}.

4,458,027

OLEFIN POLYMERIZATION CATALYSTS

Charles T. Berge, and Mark P. Mack, both of Ponca City, Okla., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

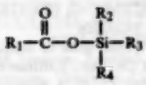
Filed Mar. 18, 1983, Ser. No. 476,897

Int. Cl.³ C08F *4/64, 4/68, 4/62*

U.S. Cl. 502—104 **15 Claims**

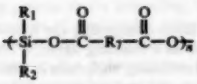
4. A method for the preparation of active polymerization catalysts comprising

(a) reacting silyl esters of the general formula



I.

and/or



II.

with magnesium compounds of the general formula

$$R_5MgR_6 \qquad \text{III}$$

and

(b) contacting the reaction product of (a) with a Group IVb to VIII transition metal compound soluble in a hydrocarbon solvent, wherein R_1, R_2, R_3, R_4, R_5, and R_6, are, independently, hydrogen halide, alkyl, alkoxy, groups containing from 1 to 30 carbon atoms, aryl, aryloxy, cycloalkyl and cycloalkoxy groups containing from 6 to 30 carbon atoms, R_7 is an alkyl group containing from 1 to 30 carbon atoms, a cycloalkyl group, alkaryl group, aralkyl group, aryl group or bicycloalkyl group containing from 6 to 30 carbon atoms and n is greater than 2.

4,458,028

PROCESS FOR PREPARING A POLYMERIZATION CATALYST AND PREPARATION OF ETHYLENE POLYMERS WITH THIS CATALYST

Lambertus J. M. A. van de Leemput, Echt, and Godefridus A. H. Nooijen, Helden-Panningen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Aug. 5, 1982, Ser. No. 405,373

Claims priority, application Netherlands, Aug. 6, 1981, 8103702

Int. Cl.³ C08F *4/68*

U.S. Cl. 502—104 **6 Claims**

1. A process for preparing a chromium- and vanadium containing catalyst component, which upon activation with heat at a temperature of from 400° to 1200° C. will effect the polymerization of α-olefins, comprising:

(1) reacting in an inert solvent a chromium component selected from the group consisting of chromium carboxylates, chromium halides and chromium chelates of 1.3-diketo compounds, and

(2) an organo-metallic compound of an element from Group II or III the periodic system in which hydrocarbyl groups with 1–20 carbon atoms are bound via a carbon atom to the element, and forming a solution in an inert solvent of a vanadium component selected from the group consisting of vanadium halides, vanadium oxyhalides vanadylesters having the formula $VO(OR)_3$, wherein R is a hydrocarbyl group, vanadium salts of carboxylic acids, vanadium chelates of 1.3-diketo compounds and the complexes obtained by reacting said vanadium compounds with an organometallic compound of an element from Group II or III of the periodic system in which hydrocarbyl groups with 1–20 carbon atoms are bound via a carbon atom to the element, provided that not more than one of said chromium- and vanadium compounds is introduced in the form of a 1.3-diketo complex; and jointly or subsequently contacting the resulting solutions with and depositing the resulting chromium- and vanadium compounds on an inert inorganic support material, and separating from said solvent the resulting catalyst component comprising said chromium and said vanadium materials deposited onto said support.

4,458,029

POURABLE SOLID MIXTURES

Kurt Munk, Grenzach, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 237,198, Feb. 23, 1981, Pat. No. 4,401,776. This application Sep. 20, 1982, Ser. No. 419,661

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1980, 5414/80

Int. Cl.³ B01J *20/00*; C09K *3/28, 15/32, 15/00*

U.S. Cl. 502—171 **8 Claims**

1. A pourable, solid mixture which contains, based on the total mixture,

(a) 49.75 to 7.5% by weight of a liquid additive which liquid itself cannot react to form a polymer which liquid is a polymerization accelerator, a polymerization initiator, a light stabilizer, an antioxidant, a plasticizer, a flame retardant or a processing assistant,

(b) 50 to 87.5% by weight of a mineral filler, and

(c) 0.25 to 5% by weight of a crystalline synthetic calcium silicate, which can be in diverse stages of hydration and has a high length/width ratio and a width dimension of less than 1 micron.

2. A mixture according to claim 1, which contains component (a) in a proportion of 35–15% by weight and component (b) in a proportion of 65–85% by weight.

3. A mixture according to claim 1, wherein the mineral filler is quartz powder, mica, talc, asbestos, slate flour, kaolin, wollastonite, powdered chalk, dolomite, magnesium carbonate, gypsum, barytes, aluminium oxide, bentones, silicic acid aerogel, lithopones, titanium dioxide, carbon black, graphite, metal oxides, glass powders, glass spheres, glass fibres, zinc sulfide, silicon carbide, cristoballite or a mixture of fillers.

4. A mixture according to claim 1, wherein the calcium silicate has a length/width ratio in the range from 10:1 to 200:1.

5. A mixture according to claim 1, wherein the calcium silicate is acicular crystallised xonotlite of the formula $Ca_6[(OH)_2/Si_6O_{17}]$.

4,458,030

ADSORBENT COMPOSITION

Tadashi Manabe, Kagawa, and Shigeo Miyata, Takamatsu, both of Japan, assignors to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1983, Ser. No. 500,398

Claims priority, application Japan, Jun. 4, 1982, 57-94792

Int. Cl.³ B01J *21/04, 21/18, 23/02, 23/06*

U.S. Cl. 502—183 **5 Claims**

1. An adsorbent composition consisting essentially of (i) about 5 to about 95% by weight of a hydrotalcite compound represented by the following formula (1)

$$(M^{2+})_xAl_2(OH)_{2x+6-ny}(A^{n-})_y \cdot mH_2O \qquad (1)$$

wherein

M^{2+} represents Mg^{2+} and/or Zn^{2+}, A^{n-} represents an anion having a valence of n, and

x, y and m are numbers which satisfy the following conditions

$$x \geq 1,\ 0 < y < 2,\ m > 0,$$

or a product of calcination at a temperature of up to about 800° C. of said hydrotalcite compound, and (ii) about 95 to about 5% by weight of activated carbon.

4,458,031

METHOD OF PREPARING A MAGNESIUM-MANGANESE CATALYST PRECURSOR AND CATALYST

Richard A. Battista, Albany; James G. Bennett, Jr., Glenmont, and John J. Kokoszka, Delmar, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 162,358, Jun. 24, 1980, abandoned. This application Mar. 9, 1982, Ser. No. 356,309

Int. Cl.³ B01J 21/10, 23/34

U.S. Cl. 502—324 8 Claims

1. A method of preparing a magnesium-manganese catalyst precursor useful after activation for the ortho-alkylation of phenolic compounds, comprising:

(A) forming a reaction mixture comprising an aqueous solution of a soluble manganous salt and a magnesium compound suspended therein, and

(B) heating the reaction mixture to a temperature and for a period of time sufficient to precipitate manganous hydroxide onto the suspended magnesium compound.

4,458,032

SILVER CATALYSTS, A PROCESS FOR THEIR PREPARATION, AND THEIR USE IN PREPARING ETHYLENE OXIDE

Siegfried Rebsdat, Burg; Sigmund Mayer, Burgkirchen/Alz, and Josef Alfranseder, Hofschallern, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 27, 1983, Ser. No. 508,475

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224322; Jun. 30, 1982, 3224323

Int. Cl.³ B01J 23/50

U.S. Cl. 502—348 12 Claims

1. A method for making a silver catalyst consisting essentially of 3 to 20 percent of silver and 0.003 to 0.05 percent of a promoter which is at least one of potassium, rubidium, and cesium, said percentages being by weight of said catalyst, present on a heat resistant porous support consisting of aluminum oxide having a specific surface area from 0.1 to 1 m^2/g (as measured by the method of Brunauer, Emmett and Teller), which method comprises:

(a) in a first impregnating step, simultaneously applying to said support from 55 to 85 percent by weight of the total amount of said silver and from 15 to 45 percent by weight of the total amount of said promoter in the form of an impregnating solution containing compounds of silver and of said promoter;

(b) drying the impregnated support obtained in step (a);

(c) in a second impregnating step, simultaneously applying to the dried support the remaining amount of said silver and of said promoter in the form of an impregnating solution containing compounds of silver and of said promoter; and

(d) heating the impregnated support obtained in step (c) to reduce the applied silver compound to metallic silver.

4,458,033

REGENERATION OF CATIONIC RESIN IN NONAQUEOUS MEDIA

Tsoung-Yuan Yan, Philadelphia, Pa., and Paul Shu, Princeton Junction, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 25, 1983, Ser. No. 488,506

Int. Cl.³ B01J 49/00

U.S. Cl. 521—26 25 Claims

1. A process for the regeneration of spent ion-exchange resin comprising contacting the spent resin for a time sufficient with a sufficient amount of anhydrous acid gas to effectively remove from said resin substantially all undesired contaminants present therein and thereafter recycling the regenerated resin for reuse.

4,458,034

FLAME RETARDANT, CHAR-FORMING, FLEXIBLE POLYURETHANE FOAMS

Roland N. Fracalossi, and Mark T. Wajer, both of Baltimore, Md., assignors to Wm. T. Burnett & Co., Inc., Baltimore, Md.

Continuation of Ser. No. 905,544, May 12, 1978, abandoned, which is a continuation-in-part of Ser. No. 656,579, Feb. 9, 1976, abandoned. This application Sep. 1, 1982, Ser. No. 413,699

Int. Cl.³ C08L 75/04

U.S. Cl. 521—107 16 Claims

1. A flexible polyurethane foam comprising the foam-forming reaction product of water as a foaming agent, a reactive polyol and a diisocyanate and including uniformly contained in said foam a flame retardant agent and an unreacted polyol having the empirical formula of $(C_6H_{10}O_5)_X$ wherein X is in excess of about 60 and containing hydroxyl groups substantially unreacted with said diisocyanate, said water being present in an amount sufficient to provide a flexible foam, and said flame retardant agent and unreacted polyol being present in an amount sufficient to inhibit flaming and to form a substantially dripless char when said foam is subjected to combustion temperatures.

4,458,035

POLYURETHANE FOAM HAVING A FLAME RETARDANT OLIGOMERIC PHOSPHATE ESTER

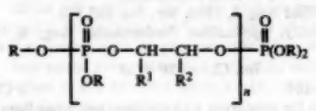
Thomas A. Hardy, Monroe, and Fred Jaffe, Ossining, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 318,288, Nov. 4, 1981, Pat. No. 4,382,042. This application Nov. 12, 1982, Ser. No. 440,788

Int. Cl.³ C08G 18/14

U.S. Cl. 521—107 3 Claims

1. A flexible polyurethane foam having a flame retardant effective amount of an oligomeric phosphate ester composition of the structural formula:



wherein R is C_1–C_{10} alkyl or C_1–C_{10} haloalkyl; R^1 and R^2 are the same or different and are hydrogen, C_1–C_{10} alkyl or C_1–C_{10} haloalkyl and n is an integer from 2 to about 10; said oligomeric phosphate ester composition having been prepared by first reacting P_2O_5 with a trialkyl or tris(haloalkyl)phosphate of the structural formula:

wherein R is the same as defined above, at a temperature from about 0° C. to about 200° C. in the presence of about 0.01% to about 5% of a phosphite of the structural formula:

wherein R is as defined above; followed by reacting the intermediate produced by the first reaction with an excess of an epoxide of the structural formula:

wherein R^1 and R^2 are as defined above, at a temperature from about 0° C. to about 200° C.

4,458,036

FLEXIBLE POLYURETHANE FOAMS CONTAINING GLYCOLURIL REACTION PRODUCTS FOR A FLAME AND EMBER DRIP RETARDANCE

Gerald Fesman, Teaneck, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 28, 1983, Ser. No. 470,121
Int. Cl.³ C08G 18/14
U.S. Cl. 521—107 19 Claims

1. In a process for preparing flexible polyurethane foam by the reaction of a polyester polyol and an organic polyisocyanate wherein the improvement comprises:

adding to the polyurethane forming reactants a blowing agent comprising water, polyurethane forming catalyst, surfactant, and a flame and dripping ember retardant effective amount of an additive combination comprising (1) halogenated flame retardant, and (2) organic solvent soluble glycoluril-formaldehyde material.

4,458,037

METHOD OF MAKING CELLULAR CROSSLINKED POLY(DICYCLOPENTADIENE)

Douglas R. Leach, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Nov. 17, 1983, Ser. No. 552,872
Int. Cl.³ C08J 9/14; C08F 4/78
U.S. Cl. 521—124 21 Claims

1. A method for making a cellular crosslinked thermoset polymer of polymerized units of dicyclopentadiene comprising: first, combining a plurality of reactant streams, one reactant stream containing an alkylaluminum iodide activator of a metathesis-catalyst system, a second reactant stream containing a catalyst of said metathesis-catalyst system, at least one reactant stream containing dicyclopentadiene and at least one reactant stream containing a blowing agent to form a reaction mixture; then heating at a temperature of about 30° C., to about 80° C. for a time sufficient for polymerization to take place and recovering the cellular crosslinked polymer.

4,458,038

PROCESS FOR THE PREPARATION OF WHITE GRAFT POLYMER DISPERSIONS AND FLAME-RETARDANT POLYURETHANE FOAMS

Gerhard G. Ramlow, Grosse Ile; Duane A. Heyman, Monroe, and Oscar M. Grace, Madison Heights, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 364,336, Apr. 1, 1982. This application Mar. 3, 1983, Ser. No. 471,722
Int. Cl.³ C08K 5/06, 5/10; C08L 29/02, 51/08
U.S. Cl. 521—137 60 Claims

1. A white, stable low viscosity graft polymer dispersion formed by polymerizing in the presence of a free radical initiator (a) an ethylenically unsaturated monomer or mixture of monomers provided that in the mixture of monomers the concentration of acrylonitrile or methacrylonitrile is less than 50 weight percent of the weight of monomers, in (b) from about 25 to about 75 weight percent based on the total weight of the dispersion, a polyol mixture comprising (1) a polyoxyalkylene polyether polyol having an equivalent weight from 100 to 10,000, (2) a macromer containing induced unsaturation consisting essentially of the reaction product of a polyoxyalkylene polyether polyol having an equivalent weight from 100 to 10,000 with a compound selected from the group consisting of maleic acid, maleic anhydride, and fumaric acid, wherein the polyol mixture contains from 0.001 to 0.09 mole of induced unsaturation per mole of polyol mixture.

4,458,039

THERMOTROPIC LIQUID CRYSTALLINE POLYMER BLEND WITH REDUCED SURFACE ABRASION

Nancy C. Eickman, Mountainside, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Feb. 7, 1983, Ser. No. 464,272
Int. Cl.³ C08K 3/34
U.S. Cl. 523—216 14 Claims

1. A molding compound comprising a thermotropic liquid crystalline polymer matrix having wollastonite fibers incorporated therein, the wollastonite fibers having an average aspect ratio of greater than about 3 to 1.

4,458,040

AQUEOUS COATING RESIN COMPOSITION

Hiroo Suzuki, Kyoto; Tadashi Kuno; Yasuo Yoshimura, both of Tokorozawa; Kiyoshi Okugami, Hatoyamamura; Hisashi Hotta, and Shinya Otsuka, both of Yokohama, all of Japan, assignors to Toyo Ink Manufacturing Co. and Toyo Seikan Kaisha Limited, both of Tokyo, Japan

Continuation of Ser. No. 250,604, Apr. 3, 1981, abandoned, which is a continuation-in-part of Ser. No. 099,324, Dec. 3, 1979, abandoned. This application Oct. 18, 1982, Ser. No. 434,729
Claims priority, application Japan, Dec. 5, 1978, 53-149635
Int. Cl.³ C08L 63/10
U.S. Cl. 523—412 4 Claims

1. An aqueous coating resin composition which comprises an aqueous dispersion of a self-emulsifiable and self-crosslinking resin composition having a pH of from 5 to 11 and being free of dispersing agents and surfactants, said resin being the neutralized product of a partial reaction product of (A) an alkali neutralizable acrylic resin having a number average molecular weight of 20,000 to 40,000, an acid value of from 80 to 240 and consisting essentially of 12 to 30% by weight of acrylic acid or methacrylic acid and 70 to 88% by weight of at least one of styrene, methylstyrene, vinyltoluene and alkyl esters of acrylic acid and methacrylic acid having 1 to 8 carbon atoms in the alkyl group, and (B) an epichlorohydrin/bisphenol epoxy resin which is selected from the group consisting of (a) epoxy resins having a number average molecular weight of 1,400 to 5,000 and two epoxy groups per molecule and (b) epoxy resins having a number average molecular weight of 2,000 to 10,000 and 1.1 to 2.0 epoxy groups per molecule, which is formed by heating an epoxy resin having a number average molecular weight of 1,400 to 5,000 and two epoxy groups per molecule in the presence of an epoxy-group modifying agent, at an (A)/(B) weight ratio of from 4/1 to ½, said partial reaction product of (A) and (B) having excess carboxyl groups in an amount sufficient to maintain the acid value of the self-emulsifiable and self-crosslinking resin composition between 30 and 200, and excess oxirane groups in an amount such that the residual ratio of the oxirane content (R) defined by the following formula:

$$R = \frac{100\ Y(M_A + M_B)}{M_B X}$$

wherein M_A represent % by weight of the acrylic resin (A) contained in the partial reaction product, M_B represents % by weight of the epoxy resin (B) contained in the partial reaction product, X represents a concentration (m-mol/100 g of solid) of oxirane group contained in the epoxy resin (B) and Y represents concentration (m-mol/100 g of solid) of oxirane group contained in the partial reaction product, is within from 5 to 95%, said partial reaction product of (A) and (B) being obtained by reacting the acrylic resin (A) with the epoxy resin (B) in the presence of a catalytic amount of an amine in the absence of an emulsifier.

4,458,041

HEAT-RESISTANT COMPOSITION

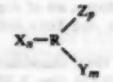
Alexei Y. Chernikhov, prospekt Vernadskogo, 93, kv. 64; Mikhail N. Yakovlev, ulitsa Amurskaya, 8, kv. 93; Nikolai S. Rogov, ulitsa I. Babushkina, 18, kv. 39; Aleftina P. Petrova, ulitsa Flotskaya, 54, kv. 93, all of Moscow; Eduard B. Martirosov, ulitsa Poperechnaya, 1, kv. 12, Moskovskaya oblast, poselok Malakhovka, and Valentin E. Gul, ulitsa Chkalova, 52, kv. 13, Moscow, all of U.S.S.R.

Continuation of Ser. No. 8,562, Feb. 1, 1979, abandoned. This application Oct. 17, 1980, Ser. No. 199,116

Int. Cl.³ C08L *63/00*

U.S. Cl. 523—435 7 Claims

1. A heat-resistant composition containing a filler, a binder and a compund in a ratio of 0.1–10,000 parts filler to 100 parts binder to 1–99 parts compound, said binder being an organic or an elemento-organic compound of the formula:



wherein R is an organic radical selected from the group consisting of radicals having from 2 to 1,000 carbon atoms; a radical selected from the group consisting of radicals having from 2 to 1,000 carbon atoms, said radical containing at least one of the elements silicon, fluorine, chlorine, bromine, nitrogen, sulphur, phosphorus, boron or oxygen, each of said elements being present in an amount of from 1 to 1,000 atoms;

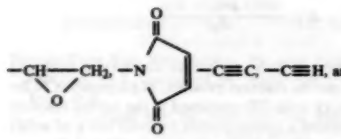
X and Y are each a radical selected from the group consisting of —NH_2, —OH, —SH, —NCO, —NSO, —NCS;

Z is a radical selected from the group consisting of —C≡N, —C=H, Z being in alpha-, beta-, ortho-, or peri- position relative to X; Z being located in alpha-, beta-, ortho-, or peri- position relative to Y;

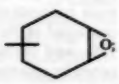
$n \geq 1$; $m \geq 1$; $p \geq 1$,

and said compound being of the formula: R—P_q, wherein R is an organic radical selected from the group consisting of radicals with a number of carbon atoms of from 2 to 1,000; and radicals selected from the group consisting of radicals with a number of carbon atoms of from 2 to 1,000, said radical containing at least one of the elements silicon, fluorine, chlorine, bromine, nitrogen, sulphur, phosphurous, boron or oxygen, each of said elements being present in an amount of from 1 to 1,000 atoms;

wherein P is a radical selected from the group consisting of



—C≡C, —C≡H, and



and wherein $q \geq 1$.

4,458,042

ABSORBENT MATERIAL

Herbert H. Espy, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 21, 1983, Ser. No. 477,120

Int. Cl.³ C08L *97/02, 9/00*; D21F *11/00*; D21H *5/18*

U.S. Cl. 524—14 8 Claims

1. An absorbent material comprising a consolidated blend consisting essentially of wood fluff pulp and from about 3 to about 30%, based on the total weight of the consolidated blend, spurted polyolefin pulp, where the spurted polyolefin pulp is treated from about 0.05 to about 3%, based on the weight of the spurted polyolefin pulp, of a nonionic or an ionic wetting agent substance having a molecular weight less than about 8000.

4,458,043

WATERPROOF SHEETING

Edwin L. Evans, Upton on Severn; Ronald Sidebottom; David W. Price, both of Cheltenham, and Roger L. Bonafont, Hertford, all of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Oct. 27, 1982, Ser. No. 436,934

Claims priority, application United Kingdom, Jun. 22, 1982, 8217991

Int. Cl.³ C08L *95/00*

U.S. Cl. 524—66 8 Claims

1. A waterproof sheeting comprising 10 to 40 parts by weight of unplasticised poly vinyl chloride, 10 to 40 parts of an ethylene vinyl acetate carbon monoxide terpolymer and 5 to 35 parts of coal tar pitch.

4,458,044

ELECTRICAL INSULATION II

Hans-Joachim Henkel, and Norbert Müller, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 27, 1983, Ser. No. 461,554

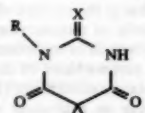
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, 3202828

Int. Cl.³ C08K *5/34*

U.S. Cl. 524—100 4 Claims

1. An electrical insulation material with an additive for preventing the formation of water trees, which comprises:

a polyolefin composition with a barbituric acid compound additive selected from barbituric acid, 2-thiobarbituric acid or a barbituric acid derivative having the formula:



wherein:

X is oxygen or sulfur,

R is hydrogen or alkyl, and

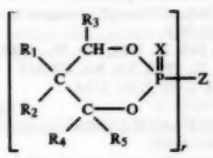
R^1 and R^2 are each independently selected from hydrogen, alkyl alkenyl, cycloalkyl, cycloalkenyl or aryl.

4,458,045
FLAMEPROOFED ORGANIC MATERIALS

Claudine Mauric, Basel, and Rainer Wolf, Allschwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 121,205, Feb. 13, 1980, Pat. No. 4,388,431. This application Mar. 18, 1983, Ser. No. 476,767
Claims priority, application Switzerland, Feb. 14, 1979, 1461/79; Feb. 23, 1979, 1839/79
Int. Cl.³ C08K 5/52, 5/53
U.S. Cl. 524—119 18 Claims

1. Flameproofed polymethyl methacrylate containing, as flameproofing agent, an effective amount of a compound or mixture of compounds of formula I



I

in which

R_1 and R_2 are independently hydrogen, C_{1-4}alkyl or phenyl; or R_1 and R_2 together with the carbon atom to which they are attached form a cyclohexylidine or cyclohexenylidine ring,

R_3 and R_4 are independently hydrogen or C_{1-4}alkyl,

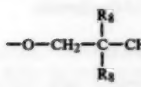
R_5 is hydrogen or methyl,

provided that when R_1 and R_2 together with the carbon atom to which they are attached form a ring, then R_3, R_4 and R_5 are all hydrogen,

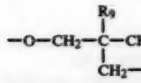
Z is a group Z_a''' or Z_b where Z_a''' is a C_{1-10} alkylene, C_{6-8}cycloalkylene, 2-butenylene or a group of the formula

$$-CH_2CHR_6-C_{m''}H_{2m''}-OOC-CHR_6CH_2-$$

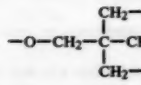
in which R_6 is hydrogen or methyl and m'' is 2, 3 or 4; and Z_b is a group of the formula



in which R_8 is C_{1-4}alkyl, phenyl, $-CH_2Cl$ or $-CH_2Br$, or a group of the formula



where R_9 is methyl or ethyl, or a group of the formula



X is oxygen when Z is Z_a''' and oxygen or sulphur when Z is Z_b,

and r is 2 when Z is Z_a''' and 2, 3 or 4 when Z is Z_b.

4,458,046
THERMOPLASTIC COMPOSITIONS OF VINYL CHLORIDE POLYMERS AND IMIDE CONTAINING POLYMERS

Edwin D. Hornbaker, and Jesse D. Jones, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 209,844, Nov. 24, 1980, abandoned. This application Jul. 20, 1982, Ser. No. 400,021
Int. Cl.³ C08L 27/06
U.S. Cl. 524—399 31 Claims

1. A thermoplastic composition which comprises in intimate admixture:

(a) a vinyl chloride polymer; and

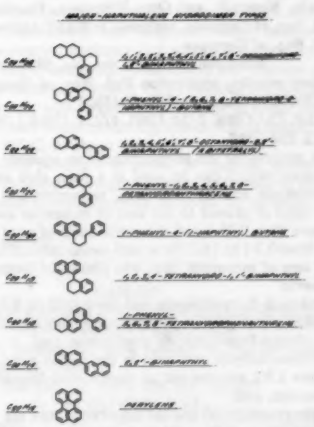
(b) (i) a thermoplastic binary copolymer of a vinyl aromatic compound and an imide derivative of an ethylenically unsaturated dicarboxylic acid or (II) a thermoplastic ternary copolymer of a vinyl aromatic compound, an imide derivative of an ethylenically unsaturated dicarboxylic acid and an anyhydride derivative of an ethylenically unsaturated dicarboxylic acid;

said admixture containing 90 to 40 weight percent of (a) and 10 to 60 weight percent of (b).

4,458,047
PROCESS FOR MAKING NAPHTHALENE HYDRODIMER MIXTURES, PRODUCT MIXTURES MADE THEREBY AND THEIR USE AS A PLASTICIZER

William D. Vanderwerff, West Chester, Pa., assignor to Sun Tech, Inc., Philadelphia, Pa.

Filed Jun. 7, 1982, Ser. No. 385,957
Int. Cl.³ C08K 5/01
U.S. Cl. 524—476 16 Claims



1. A process for making naphthalene hydrodimer mixtures which comprises reacting approximately equimolar amounts of a hydronaphthalene and naphthalene or an alkylnaphthalene with a strong acid catalyst at temperature between about 200° and about 350° C.

4,458,048
ALKYL SULFONATES OF POLYVINYL ALCOHOL AS VISCOSIFIERS IN SALINE SOLUTIONS

Kirk D. Schmitt, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

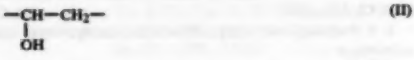
Filed Jun. 23, 1982, Ser. No. 391,214
Int. Cl.³ C08L 29/04
U.S. Cl. 524—557 7 Claims

1. An aqueous fluid comprising water having a salinity of at least 5 weight percent, having added thereto polymeric alkyl

sulfonate salt, said polymeric alkyl sulfonate salt being present in an amount sufficient to thicken said fluid, said polymeric alkyl sulfonate salt having the formula

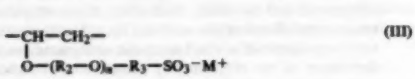
(I)

wherein R_1 represents repeating polymeric units, said units consisting essentially of (i) units of the formula



(II)

and (ii) units of the formula



(III)

having a mer % sufficient to impart enhanced brine solubility and thickening characteristics thereto wherein:

(a) R_2—O is ethyleneoxy, propyleneoxy or mixtures thereof;

(b) n is zero or greater, provided that $(R_2—O)_n$ has 18 or less carbon atoms;

(c) R_3 is a hydrocarbyl group having between 2 and 6 carbon atoms; and

(d) M is a cation.

4,458,049

PREPARATION OF COCONDENSATES WHICH PRODUCE WEATHER-RESISTANT BONDING

Hans Diem, Mannheim; Robert Fritsch, Dudenhofen; Heinz Lehnert; Guenther Matthias, both of Frankenthal; Hermann Schatz, Neustadt, and Otto Wittmann, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 30, 1982, Ser. No. 393,631

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1981, 3125874; Nov. 14, 1981, 3145328

Int. Cl.³ C08K *3/24;* **C08L** *61/14;* **C09J** *1/00, 3/16*

U.S. Cl. 524—595 **4 Claims**

1. A process for the preparation of an aqueous solution of a condensate which can be used as a resin glue and comprises formaldehyde and at least urea, melamine and phenol, the molar ratio of phenol to the sum of melamine and urea being not more than 0.25:1 and the molar ratio of urea to melamine being from 0.2:1 to 1:0.2 for a total molar ratio of formaldehyde to the sum of melamine, urea and phenol of from about 1.1 to 2, wherein

(a) phenol, formaldehyde and from 0.02 to 0.35 mole of an alkali metal bisulfite per mole of phenol are reacted to give a phenol-formaldehyde condensate, and

(b) formaldehyde and urea in the molar ratio of not more than 2.5:1 are reacted to give a urea-formaldehyde condensate, and

(c) the products (a) and (b) together in turn are reacted with melamine and formaldehyde in such a ratio that the molar ratios of melamine, urea, phenol and formaldehyde mentioned at the outset are either obtained directly or

(d) may be obtained only after the product obtained according to (c) is reacted further with urea in an amount of not more than 75% of the total amount of urea intended.

4,458,050

POLYMER DISPERSIONS AND THEIR USES

Duane A. Heyman, Monroe, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 24, 1983, Ser. No. 460,312

Int. Cl.³ C08K *5/34, 5/22*

U.S. Cl. 524—726 **10 Claims**

1. A polymer dispersion prepared by the in situ polymerization of about 10 percent to about 70 percent by weight based upon the total weight of the dispersion of an ethylenically unsaturated monomer or mixture of monomers in a chain extender of a molecular weight of 62 to less than 400 selected from the group consisting of aliphatic and/or araliphatic diols having 2 to 14 carbon atoms in the presence of a free radical polymerization initiator and a polyamide stabilizer having a pendent amide group said polyamide having an average molecular weight of from about 5000 to about 1,000,000, wherein the weight ratio of the monomer to the polyamide is from about 2:1 to about 100:1.

4,458,051

POURABLE SOLID MIXTURE

Kurt Munk, Grenzach, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 237,198, Feb. 23, 1981, Pat. No. 4,401,776. This application Sep. 20, 1982, Ser. No. 419,662

Int. Cl.³ C08K *3/40, 3/36, 3/34*

U.S. Cl. 524—779 **7 Claims**

1. A pourable, solid mixture which consists essentially of, based on the total mixture,

(a) 49.75 to 7.5% by weight of a liquid capable of reacting to form a polymer,

(b) 50 to 87.5% by weight of a mineral filler, and

(c) 0.25 to 5% by weight of a crystalline synthetic calcium silicate, which can be in diverse stages of hydration and has a high length/width ratio and a width dimension of less than 1 micron.

4,458,052

ALKYL SULFONATES OF POLYVINYL ALCOHOL AS VISCOSIFIERS IN SALINE SOLUTIONS

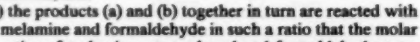
Kirk D. Schmitt, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 391,214, Jun. 23, 1982. This application Sep. 30, 1982, Ser. No. 429,932

Int. Cl.³ C08F *216/06, 228/02*

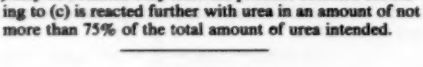
U.S. Cl. 525—61 **9 Claims**

1. A polymeric alkyl sulfonate salt of the formula



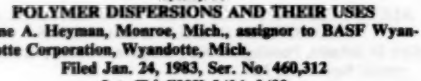
(I)

wherein R_1 represents repeating polymeric units, said units consisting essentially of (i) units of the formula



(II)

and (ii) units of the formula



(III)

having a mer % sufficient to impart enhanced brine solubility and thickening characteristics thereto

wherein:

(a) R_2—O is ethyleneoxy, propyleneoxy or mixtures thereof;

(b) n is zero or greater, provided that $(R_2—O)_n$ has 18 or less carbon atoms;

(c) R_3 is a hydrocarbyl group having between 2 and 6 carbon atoms; and

(d) M is a cation.

4,458,053

NYLON COMFORT FIBER CONTAINING POLY(N,N-DIMETHYLACRYLAMIDE)

Robert A. Lofquist, Richmond; Ian C. Twilley, Chester, and Peter R. Saunders, Richmond, all of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 31, 1983, Ser. No. 547,157

Int. Cl.³ C08F 8/30; C08L 33/26, 51/06

U.S. Cl. 525—183 **4 Claims**

1. The method of preparing a nylon fiber useful for improved comfort for wearers of apparel fabric made therefrom, comprising adding from about 5 to 15% by weight of poly(N,N-dimethylacryamide) having a viscosity of from about 20 to 1000 centipoise to from about 85% to 95% by weight caprolactam then polymerizing the mixture conventionally, then extruding and washing the resultant polymer conventionally, then forming the resultant polymer into fiber by conventional spinning.

4,458,054

HEAT-HARDENABLE CATIONIC WATER-DILUTABLE BINDERS

Gerhard Schmözer; Heiner Verdino, and Wolfgang Daimer, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Nov. 22, 1982, Ser. No. 443,456

Claims priority, application Austria, Nov. 26, 1981, 5083/81

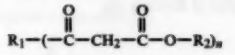
Int. Cl.³ C08L 63/02

U.S. Cl. 525—327.3 **5 Claims**

1. Heat-hardenable cationic binders comprising blends of amine group carrying polymers and a crosslinking component which is film-forming with said polymer through transesterification at elevated temperature and which is water-dilutable upon protonation of the amine groups comprising

(a) 60 to 95% by weight of a polymer having a hydroxyl value of from 40 to 450 mg KOH/g and an amine value of from 20 to 150 mg KOH/g, water-soluble or water-dilutable upon protonation of the basic groups of said polymer, and

(b) 5 to 40% by weight of a cross-linking component of the general formula —



n having a value of from 1 through 5,

R_1 being the moiety of a monoalcohol having from 1 to 8 C-atoms or of a polyol or of a polyamine or of a polyepoxy compound remaining after reaction with one or more carboxylic acid groups, and

R_2 being a straight or branched chain alkyl radical with from 1 to 8 C-atoms.

4,458,055

STORABLE PLASTIC ORGANOPOLYSILOXANE MOLDING COMPOSITIONS

Hans Sattlegger, Odenthal; Karl Schnurrbusch, and Hans-Gerd Metzinger, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,289

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114773

Int. Cl.³ C08L 83/06; C08G 77/16, 77/26

U.S. Cl. 525—477 **7 Claims**

1. A process for the preparation of a plastic organopolysiloxane composition which can be stored in the absence of water and which is convertable even at room temperature into rubber-elastic compositions by the action of water or atmospheric moisture, comprising mixing a hydroxyl-terminated poly-diorganopolysiloxane with about 0.1–15% by weight of the total mixture of a substance of the formula

$$R_{3\text{-}m}(RO)_2Si[NHR'R_nSi(OR)_{3-n}]_{4-m}$$

wherein

R is an alkyl radical having 1–4 C atoms,

R' is a divalent alkylene radical having 1–6 C atoms or a unit of the formula $-(CH_2)_3NH(CH_2)_2-$ or $-(CH_2)_2-NH(CH_2)_2NH(CH_2)_2-$,

n is 0, 1 or 2, and

m = W + Z = 0, 1 or 2,

or a partial hydrolysis product thereof as a cross-linking agent.

4,458,056

TERTIARY ALCOHOL-DIBLOCKED DIISOCYANATE UREA URETHANE OLIGOMERS AND COATING COMPOSITIONS COMPRISING SAME

Joseph W. Holubka, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 334,793, Dec. 28, 1981, Pat. No. 4,409,380. This application Jan. 5, 1983, Ser. No. 455,697

Int. Cl.³ C08L 63/00; C08G 18/80, 18/32

U.S. Cl. 525—528 **16 Claims**

1. A solvent based resin composition comprising:

A. A chain-extendable crosslinkable tertiary alcohol-diblocked diisocyanate urea urethane oligomer of number average molecular weight of about 300 to about 5000 comprising the reaction product of primary or secondary alkanolamine of molecular weight about 60 to about 700, with half-blocked diisocyanate of molecular weight about 120 to about 2000 in molar ratio of about 1:2, respectively, whereby both the hydroxy and amine functionality react with free isocyanate groups to form urethane and urea linkages respectively, said oligomer being substantially free of unreacted hydroxy and amino functionality, said half-blocked diisocyanate comprising the reaction product of an alcohol blocking agent bearing a tertiary hydroxyl group, with organic diisocyanate in molar ratio of about 1:1, said oligomer having a de-blocking temperature of about 80° C. to about 220° C.;

B. polyepoxide having 2 to about 10 epoxide groups and having a molecular weight of about 100 to about 1000, in weight ratio to said oligomer of about 1:1 to about 1:10; and

C. organic solvent.

4,458,057

PROCESS FOR PRODUCING SPHERICAL AND POROUS VINYL RESIN PARTICLES

Pijus K. Basu, Brecksville, Ohio, assignor to The BF Goodrich Company, Akron, Ohio

Filed Oct. 27, 1982, Ser. No. 437,097

Int. Cl.³ C08F 2/20

U.S. Cl. 526—88 **16 Claims**

1. A process for producing spherical particles of polymer having high porosity which comprises, polymerizing one or more ethylenically unsaturated monomers having at least one terminal $CH_2{=}C<$ group in the form of discrete droplets in an aqueous reaction medium containing, a monomer-soluble free radical yielding catalyst, a dispersant comprising a water-insoluble, crosslinked interpolymer of acrylic acid, and at least one surfactant containing one or more poly (ethylene oxide) segments, agitating said medium to form droplets of monomer(s) therein said agitator being operated at an rpm. in the range of about 10 rpm to 275 rpm. with a blade tip speed in the range of about 2 ft./sec. to about 65 ft./sec using a reactor having a capacity of about 30 gallons to about 40,000 gallons, adding a water-soluble base to said medium to neutralize the dispersant to a pH of from about 4 to about 7, polymerizing said monomer(s) in a first stage at a temperature in the range of about 1.0° C. to about 100° C. with agitation below that at

which the dispersion was formed, continuing the polymerization at said temperature and agitation to a conversion of about 10% to about 30% then increasing the agitation in a second stage to a level not more than that at which the dispersion was formed at the same temperature as in said first stage until the reaction is complete, and recovering the spherical, porous particles of polymer having a diameter in the range of about 30 microns to about 1000 microns, wherein polymer buildup on the surfaces of the reactor is substantially reduced.

4,458,058

POLYMERIZATION METHOD

Robert A. Dombro, Clinton, Iowa, assignor to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 270,004, Jun. 3, 1981, Pat. No. 4,378,304. This application Oct. 8, 1982, Ser. No. 433,547

Int. Cl.³ C08F 4/02, 10/02

U.S. Cl. 526—129 **11 Claims**

1. The method of making polymers of ethylene comprising polymerizing said ethylene under polymerizing conditions with a catalyst prepared by the consecutive steps of:

(1) reacting in a liquid hydrocarbon slurry at a temperature of between ambient and about 150° C. a finely divided, difficulty reducible, porous calcined support comprising silica or alumina, said hydrocarbon having between about 4 to 8 carbon atoms, with

(2) a magnesium compound of the formula MgR_2 wherein R is an alkyl group and said compound is essentially free of aluminum alkyls, the molar ratio of said magnesium compound to the surface hydroxyls of said calcined support being between about 0.25–3/1, then reacting, at a temperature of about 90°–100° C. the resulting product with

(3) a primary hydrocarbyl alcohol, the molar ratio of said alcohol to the magnesium in the reaction product of step (2) being from about 0.5 to about 3 to 1, then reacting in a hydrocarbon slurry at about 90–150° C. the product of this with

(4) titanium tetrachloride without first removing unreacted alcohol from the product of (3), the molar ratio of said titanium tetrachloride to said alcohol being between about 1–10/1 and the molar ratio of said titanium tetrachloride to said magnesium compound being between about 0.5–4/1

(5) removing essentially all unreacted components and by-products from the reactions of steps (1), (2), (3) and (4) by washing with a dry hydrocarbon liquid or gas at temperatures between ambient to about 150° C., followed by

(6) activating the resulting reaction product by treating in the substantial absence of air with a cocatalyst that is either hydrogen or a Group IA, IIA, IIIA or IIB organometallic compound or mixture of two or more of these.

4,458,059

LIQUID FILTRATION SYSTEM

Larry D. Fields, Mira Loma, Calif., assignor to Yardney Corporation, Pawcatuck, Conn.

Filed Aug. 25, 1983, Ser. No. 526,274

The portion of the term of this patent subsequent to Apr. 10, 2000, has been disclaimed.

Int. Cl.³ B01D 23/10, 39/14

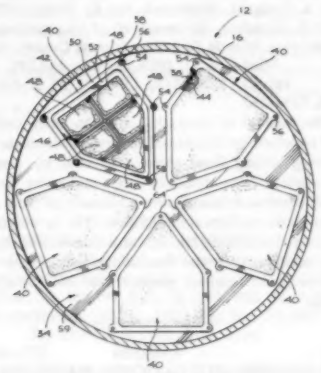
U.S. Cl. 210—266 **11 Claims**

1. An improved liquid filtration system, such system comprising, in combination:

a. a vessel having a plurality of spaced interconnected walls defining a central cavity and having a liquid inlet spaced from a liquid outlet;

b. a porous, self-supporting, rigid removable filter comprising a plurality of modules, each said module comprising a self-supporting filter body formed of a plurality of granules cemented together by set organic resin and disposed in a frame;

c. connector means releasably securing said modules in said cavity adjacent said outlet so as to separate said outlet from said inlet; and,



d. a mass of loose particles of filtering medium disposed above said rigid filter in said cavity and supported thereby.

4,458,060

CROSS-LINKED VINYL CHLORIDE POLYMER

Kazumasa Yamane, Kobe, and Masahiro Kobayashi, Amagasaki, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

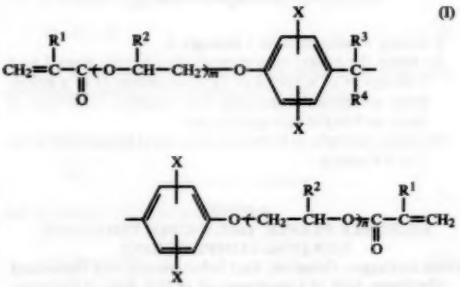
Filed Jun. 1, 1982, Ser. No. 383,611

Claims priority, application Japan, May 29, 1981, 56-82862

Int. Cl.³ C08F 214/06, 220/20

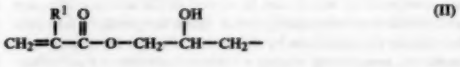
U.S. Cl. 526—292.3 **16 Claims**

1. A cross-linked vinyl chloride polymer comprising (a) a first member selected from the group consisting of vinyl chloride and a mixture of at least 50% by weight of vinyl chloride and a vinyl monomer copolymerizable therewith and (b) a second member selected from the group consisting of a compound of the general formula (I):



(I)

wherein R^1 is hydrogen or methyl; R^2 is hydrogen or an alkyl group having 1 to 4 carbon atoms; R^3 and R^4 are independently selected from the group consisting of hydrogen, $-CH_3$, $-CH_2CH_3$ and $-CH_2CH_2COOH$; m and n are integers each having a value of 1 to 10; and X is bromine, chlorine or hydrogen, a compound of the general formula (II):



(II)

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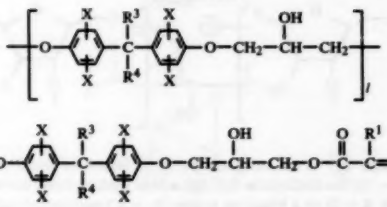
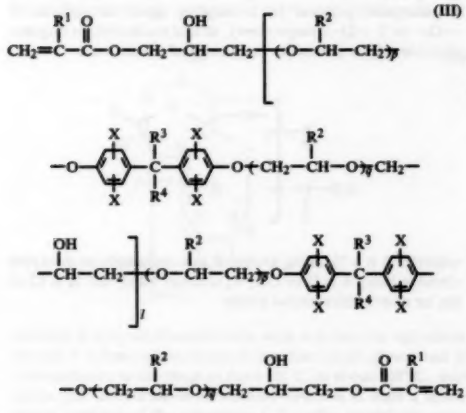


wherein R^1, R^3, R^4 and X are as defined above, and l is 0 or an integer having a value of 1 to 20, and a compound of the general formula (III):



(III)

wherein R^1, R^2, R^3, R^4, X and l are as defined above, and p and q are integers each having a value of 1 to 5; the amount of component (a) being 0.01 to 21 percent by weight of the total amount of components (a) and (b).

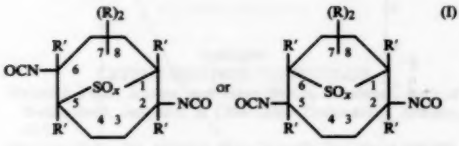
4,458,061

9-THIABICYCLONONANEDIISOCYANATES AND POLYMERS MADE THEREFROM

David W. Hughes, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 29, 1982, Ser. No. 426,550
Int. Cl.³ C08G 18/77
U.S. Cl. 528—73 **32 Claims**

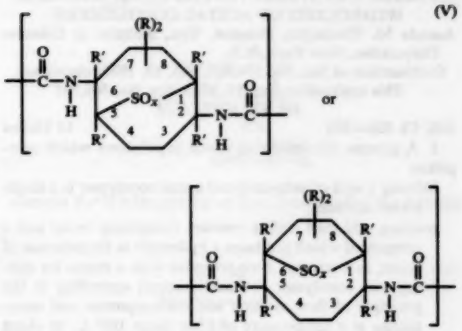
1. A monomer of the formula:



(I)

wherein each R, which may be the same or different, is an alkyl group containing 1 to 3 carbon atoms; each R′, which may be the same or different, is hydrogen or methyl, at least two R′ are hydrogen; and x 0, 1 or 2.

15. A polymer containing a characterizing amount of the monomer units:



(V)

wherein each R, which may be the same or different, is an alkyl group containing 1 to 3 carbon atoms; each R′, which may be the same or different, is hydrogen or methyl, at least two R′ are hydrogen; and x is 0, 1 or 2.

4,458,062

CONTINUOUSLY PRODUCED MELT REACTED MELAMINE-FORMALDEHYDE RESINS

Elmer P. Blasing; Ronald J. Keeling, and Jin-Young K. Roe, all of Cincinnati, Ohio, assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 14, 1983, Ser. No. 466,172
Int. Cl.³ C08G 12/32
U.S. Cl. 528—254 **4 Claims**

1. A continuous method for the one-shot preparation of a melamine-formaldehyde resin which comprises:

charging crystalline melamine and solid formaldehyde, in the absence of solvent, into a single pass reactor at a temperature ranging from about 120° C. to about 180° C. for from about 30 seconds to about 5 minutes and recovering the resultant resin as a molten liquid.

4. The melamine-formaldehyde resin produced by the process of claim **1**.

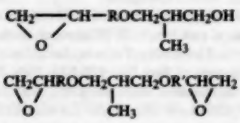
4,458,063

2-METHYL-1,3-PROPYLENE GLYCOL MONO- OR DI-ALKYLENE OXIDE ETHER

Tatsuya Kanno, and Yuzo Toga, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 18, 1983, Ser. No. 485,687
Claims priority, application Japan, Apr. 22, 1982, 57-67885; Apr. 22, 1982, 57-67886; Apr. 22, 1982, 57-67887
Int. Cl.³ C08G 59/22
U.S. Cl. 528—418 **2 Claims**

1. 2-Methyl-1,3-propylene glycol mono- or di-alkylene oxide ether having the formulae (I) or (II):



(I)

(II)

in which R and R′ are linear or branched alkylene groups with C_1–C_3.

which the dispersion was formed, continuing the polymerization at said temperature and agitation to a conversion of about 10% to about 30% then increasing the agitation in a second stage to a level not more than that at which the dispersion was formed at the same temperature as in said first stage until the reaction is complete, and recovering the spherical, porous particles of polymer having a diameter in the range of about 30 microns to about 1000 microns, wherein polymer buildup on the surfaces of the reactor is substantially reduced.

4,458,058

POLYMERIZATION METHOD

Robert A. Dombro, Clinton, Iowa, assignor to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 270,004, Jun. 3, 1981, Pat. No. 4,378,304. This application Oct. 8, 1982, Ser. No. 433,547

Int. Cl.³ C08F 4/02, 10/02

U.S. Cl. 526—129 **11 Claims**

1. The method of making polymers of ethylene comprising polymerizing said ethylene under polymerizing conditions with a catalyst prepared by the consecutive steps of:

(1) reacting in a liquid hydrocarbon slurry at a temperature of between ambient and about 150° C. a finely divided, difficulty reducible, porous calcined support comprising silica or alumina, said hydrocarbon having between about 4 to 8 carbon atoms, with

(2) a magnesium compound of the formula MgR_2 wherein R is an alkyl group and said compound is essentially free of aluminum alkyls, the molar ratio of said magnesium compound to the surface hydroxyls of said calcined support being between about 0.25–3/1, then reacting, at a temperature of about 90°–100° C. the resulting product with

(3) a primary hydrocarbyl alcohol, the molar ratio of said alcohol to the magnesium in the reaction product of step (2) being from about 0.5 to about 3 to 1, then reacting in a hydrocarbon slurry at about 90–150° C. the product of this with

(4) titanium tetrachloride without first removing unreacted alcohol from the product of (3), the molar ratio of said titanium tetrachloride to said alcohol being between about 1–10/1 and the molar ratio of said titanium tetrachloride to said magnesium compound being between about 0.5–4/1

(5) removing essentially all unreacted components and by-products from the reactions of steps (1), (2), (3) and (4) by washing with a dry hydrocarbon liquid or gas at temperatures between ambient to about 150° C., followed by

(6) activating the resulting reaction product by treating in the substantial absence of air with a cocatalyst that is either hydrogen or a Group IA, IIA, IIIA or IIB organometallic compound or mixture of two or more of these.

4,458,059

LIQUID FILTRATION SYSTEM

Larry D. Fields, Mira Loma, Calif., assignor to Yardney Corporation, Pawcatuck, Conn.

Filed Aug. 25, 1983, Ser. No. 526,274

The portion of the term of this patent subsequent to Apr. 10, 2000, has been disclaimed.

Int. Cl.³ B01D 23/10, 39/14

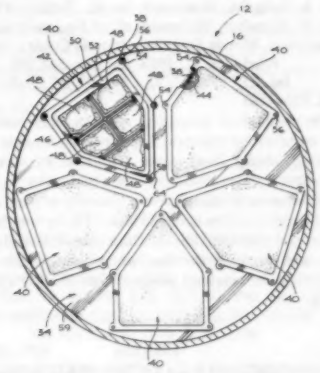
U.S. Cl. 210—266 **11 Claims**

1. An improved liquid filtration system, such system comprising, in combination:

a. a vessel having a plurality of spaced interconnected walls defining a central cavity and having a liquid inlet spaced from a liquid outlet;

b. a porous, self-supporting, rigid removable filter comprising a plurality of modules, each said module comprising a self-supporting filter body formed of a plurality of granules cemented together by set organic resin and disposed in a frame;

c. connector means releasably securing said modules in said cavity adjacent said outlet so as to separate said outlet from said inlet; and,



d. a mass of loose particles of filtering medium disposed above said rigid filter in said cavity and supported thereby.

4,458,060

CROSS-LINKED VINYL CHLORIDE POLYMER

Kazumasa Yamane, Kobe, and Masahiro Kobayashi, Amagasaki, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

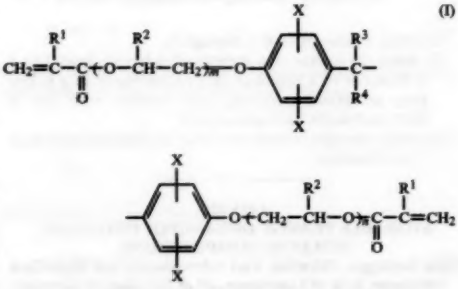
Filed Jun. 1, 1982, Ser. No. 383,611

Claims priority, application Japan, May 29, 1981, 56-82862

Int. Cl.³ C08F 214/06, 220/20

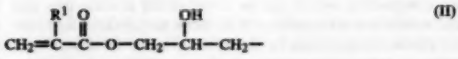
U.S. Cl. 526—292.3 **16 Claims**

1. A cross-linked vinyl chloride polymer comprising (a) a first member selected from the group consisting of vinyl chloride and a mixture of at least 50% by weight of vinyl chloride and a vinyl monomer copolymerizable therewith and (b) a second member selected from the group consisting of a compound of the general formula (I):



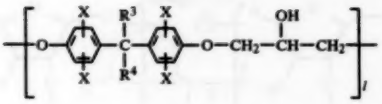
(I)

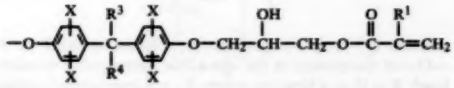
wherein R^1 is hydrogen or methyl; R^2 is hydrogen or an alkyl group having 1 to 4 carbon atoms; R^3 and R^4 are independently selected from the group consisting of hydrogen, $-CH_3$, $-CH_2CH_3$ and $-CH_2CH_2COOH$; m and n are integers each having a value of 1 to 10; and X is bromine, chlorine or hydrogen, a compound of the general formula (II):



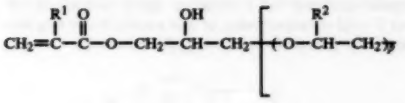
(II)

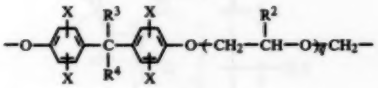
-continued

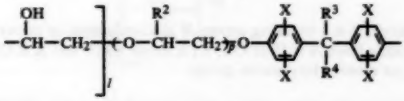


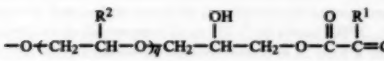


wherein R^1, R^3, R^4 and X are as defined above, and l is 0 or an integer having a value of 1 to 20, and a compound of the general formula (III):









wherein R^1, R^2, R^3, R^4, X and l are as defined above, and p and q are integers each having a value of 1 to 5; the amount of component (a) being 0.01 to 21 percent by weight of the total amount of components (a) and (b).

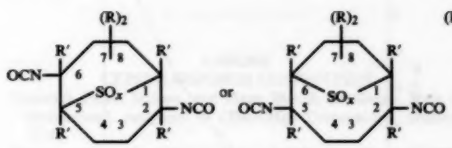
4,458,061

9-THIABICYCLONONANEDIISOCYANATES AND POLYMERS MADE THEREFROM

David W. Hughes, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

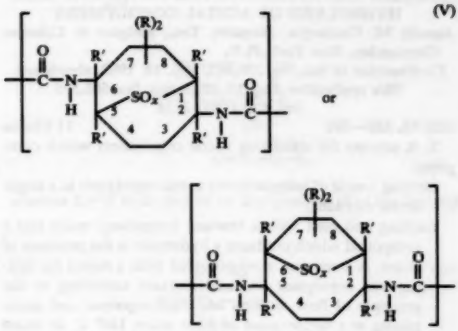
Filed Sep. 29, 1982, Ser. No. 426,550
Int. Cl.³ C08G *18/77*
U.S. Cl. 528—73 **32 Claims**

1. A monomer of the formula:



wherein each R, which may be the same or different, is an alkyl group containing 1 to 3 carbon atoms; each R′, which may be the same or different, is hydrogen or methyl, at least two R′ are hydrogen; and x 0, 1 or 2.

15. A polymer containing a characterizing amount of the monomer units:



wherein each R, which may be the same or different, is an alkyl group containing 1 to 3 carbon atoms; each R′, which may be the same or different, is hydrogen or methyl, at least two R′ are hydrogen; and x is 0, 1 or 2.

4,458,062

CONTINUOUSLY PRODUCED MELT REACTED MELAMINE-FORMALDEHYDE RESINS

Elmer P. Blasing; Ronald J. Keeling, and Jin-Young K. Roe, all of Cincinnati, Ohio, assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 14, 1983, Ser. No. 466,172
Int. Cl.³ C08G *12/32*
U.S. Cl. 528—254 **4 Claims**

1. A continuous method for the one-shot preparation of a melamine-formaldehyde resin which comprises:

charging crystalline melamine and solid formaldehyde, in the absence of solvent, into a single pass reactor at a temperature ranging from about 120° C. to about 180° C. for from about 30 seconds to about 5 minutes and recovering the resultant resin as a molten liquid.

4. The melamine-formaldehyde resin produced by the process of claim **1**.

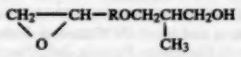
4,458,063

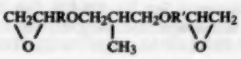
2-METHYL-1,3-PROPYLENE GLYCOL MONO- OR DI-ALKYLENE OXIDE ETHER

Tatsuya Kanno, and Yuzo Toga, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 18, 1983, Ser. No. 485,687
Claims priority, application Japan, Apr. 22, 1982, 57-67885; Apr. 22, 1982, 57-67886; Apr. 22, 1982, 57-67887
Int. Cl.³ C08G *59/22*
U.S. Cl. 528—418 **2 Claims**

1. 2-Methyl-1,3-propylene glycol mono- or di-alkylene oxide ether having the formulae (I) or (II):





in which R and R′ are linear or branched alkylene groups with C_1–C_3.

4,458,064

PROCESS AND APPARATUS FOR CONTINUAL MELT HYDROLYSIS OF ACETAL COPOLYMERS

Ananda M. Chatterjee, Houston, Tex., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 350,502, Feb. 19, 1982, abandoned. This application Aug. 19, 1983, Ser. No. 505,595

Int. Cl.³ C08G *2/28*

U.S. Cl. 528—501 **11 Claims**

1. A process for stabilizing acetal copolymers which comprises:

forming a melt of unhydrolyzed acetal copolymer in a single screw extruder;

reacting said melt with a reactant comprising water and a compound which produces a hydroxide in the presence of water, in a reaction zone provided with a means for mixing said copolymer and said reactant according to the principle of flow division and rearrangement and maintaining at a temperature of from about 160° C. to about 240° C., and at a pressure of from about 150 to about 10,000 psia, for a time of from about 30 seconds to about 15 minutes; and

devolatilizing said reacted copolymer immediately upon exiting from said reaction zone to remove undesirable volatile side products from said copolymer.

4,458,065

7-N-(SUBSTITUTED-APRAMYCIN ANTIBIOTIC DERIVATIVES AND INTERMEDIATES THEREFOR

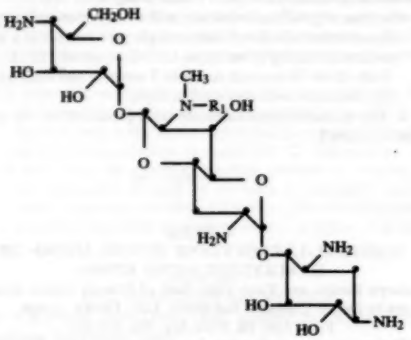
Herbert A. Kirst, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 17, 1983, Ser. No. 467,418

Int. Cl.³ C07H *15/22*

U.S. Cl. 536—16.8 **13 Claims**

1. A compound of the formula



wherein R_1 is methyl, ethyl, n-propyl or n-butyl; and the pharmaceutically acceptable acid addition salts thereof.

4,458,066

PROCESS FOR PREPARING POLYNUCLEOTIDES

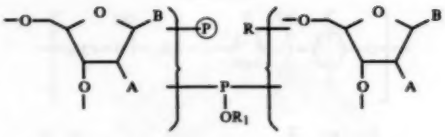
Marvin H. Caruthers, and Mark D. Matteucci, both of Boulder, Colo., assignors to University Patents, Inc., Norwalk, Conn.

Continuation-in-part of Ser. No. 126,025, Feb. 29, 1980, abandoned. This application Mar. 24, 1981, Ser. No. 247,144

Int. Cl.³ C07H *19/10, 19/20, 21/02, 21/04*

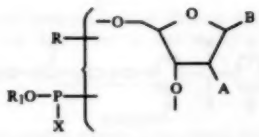
U.S. Cl. 536—27 **43 Claims**

1. A modified inorganic polymer represented by the formula:



wherein (P) is an inorganic polymer linked to the 3' or 5' —O— of the nucleoside through a base hydrolyzable covalent bond; R is H or a blocking group; R_1 is a hydrocarbyl radical containing up to 10 carbons; each B is a nucleoside or deoxynucleoside base; and each A is H or OR.

18. A process for production of oligonucleotides which comprises the step of condensing the 3' —OH or 5' —OH group of a nucleoside or oligonucleotide covalently linked to an inorganic polymer by a coupling agent through the 5' —O— or 3' —O—, respectively, of said nucleoside or oligonucleotide with a phosphite compound of the formula:



wherein R is a blocking group; B is a nucleoside or deoxynucleoside base; A is H or OR; R_1 is lower alkyl; and X is Cl or Br, or a secondary amino group.

4,458,067

PROCESS FOR PRODUCING $N^6,O^{2'}$-DIACYLADENOSINE-3',5'-CYCLIC PHOSPHORIC ESTER ALKALI METAL SALTS

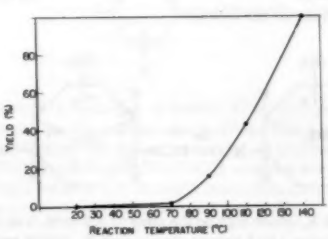
Nobuyuki Yamaji, Noda; Kyoko Tahara, Kashiwa, and Motohiko Kato, Noda, all of Japan, assignors to Kikkoman Corporation, Noda, Japan

Filed Dec. 30, 1981, Ser. No. 336,612

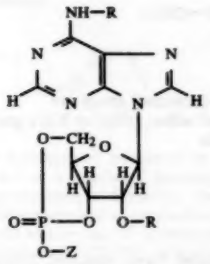
Claims priority, application Japan, Jul. 7, 1980, 55-91702

Int. Cl.³ C07H *15/12, 17/00*

U.S. Cl. 536—27 **5 Claims**

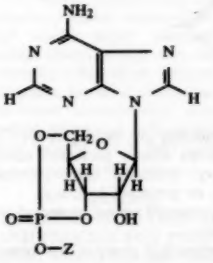


1. A process for producing an N^6,O^2-diacyladenosine-3',5'-cyclic phosphoric ester alkali metal salt represented by the general formula:



(I)

wherein Z is an alkali metal atom, and R is an acyl group, which comprises reacting an adenosine-3',5'-cyclic phosphoric ester alkali metal salt represented by the general formula:



(II)

wherein Z is an alkali metal atom, with a carboxylic anhydride having 4 or less carbon atoms in the absence of solvent and at a temperature in the range of from 70° C. to about 200° C., said carboxylic anhydride in an amount which is at least a thrice molar quantity of the adenosine-3',5'-cyclic phosphoric ester alkali metal salt (II).

4,458,068

WATER-SOLUBLE, TERNARY CELLULOSE ETHERS

Patricia A. Warner, Denham Springs, La.; George K. Greminger, Midland, Mich., and Clark W. Gibson, Denham Springs, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 25, 1983, Ser. No. 478,744
Int. Cl.³ C08B *11/08, 11/193*
U.S. Cl. 536—91 **6 Claims**

1. A ternary hydroxyethylhydroxypropylmethylcellulose ether having a methoxyl degree of substitution of about 0.9 to about 2.1, a hydroxyethoxyl molar substitution of about 0.2 to about 0.5, and a hydroxypropoxyl molar substitution of about 0.08 to about 0.4.

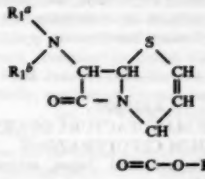
4,458,069

CEPHALOSPORIN COMPOUNDS

Heinrich Peter, Riehen, and Hans Bickel, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

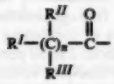
Division of Ser. No. 670,035, Mar. 24, 1976, Pat. No. 4,269,977, which is a continuation of Ser. No. 255,826, May 22, 1972, abandoned. This application Jan. 14, 1981, Ser. No. 225,086
Int. Cl.³ C07D *501/04;* **A61K** *31/545*
U.S. Cl. 544—16 **8 Claims**

1. A compound selected from the group consisting of ceph-2-em compounds of the formula



(IB)

wherein R_1^a is hydrogen or an acyl group R_1^A of the formula



(IA)

in which n represents O and R^I represents cycloalkyl with 5–7 ring carbon atoms substituted by a member selected from the group consisting of amino and sulphoamino, or represents a member selected from the group consisting of phenyl, naphthyl and tetrahydronaphthyl, and these groups substituted by a member selected from the group consisting of hydroxyl, lower alkoxy and halogen, or represents 4-isoxazolyl and 4-isoxazolyl substituted by a member selected from the group consisting of lower alkyl, phenyl and halogeno-phenyl, or represents amino N-substituted by a member selected from the group consisting of lower alkyl and halogen-lower alkyl, or n represents 1, R^I represents a member selected from the group consisting of lower alkyl and lower alkyl substituted by a member selected from the group consisting of halogeno, phenyloxy, hydroxyphenyloxy, halogeno-phenyloxy, amino and carboxyl, or represents lower alkenyl or represents a member selected from the group consisting of phenyl, hydroxy-phenyl, halogeno-phenyl and phenyloxy-phenyl, or represents a member selected from the group consisting of pyridyl, pyridinium, thienyl, 1-imidazolyl and 1-tetrazolyl or such heterocylic radical substituted by a member selected from the group consisting of lower alkyl, amino and aminomethyl, or represents a methyl selected from the group consisting of lower alkoxy, phenyloxy, hydroxyphenyloxy and halogeno-phenyloxy, or represents a member selected from the group consisting of lower alkylthio and lower alkenylthio, or represents a member selected from the group consisting of phenylthio, 2-imidazolylthio, 1,2,4-triazol-3-ylthio, 1,3,4-triazol-2-ylthio, 1,2,4-thiadiazol-3-ylthio, 1,3,4-thiadiazol-2-ylthio and 5-tetrazolylthio, and such groups substituted by lower alkyl, or represents a member selected from the group consisting of halogeno, carboxyl, lower alkoxy-carbonyl, cyano, carbamoyl and carbamoyl N-substituted by a member selected from the group consisting of lower alkyl and phenyl, or represents a member selected from the group consisting of lower alkanoyl and azido, and R^{II} and R^{III} represent hydrogen, or n represents 1, R^I represents a member selected from the group consisting of phenyl and thienyl and these groups substituted by a member selected from the group consisting of hydroxyl and halogeno, or represents 1,4-cyclohexadienyl, R^{II} represents a member selected from the group consisting of amino, lower alkoxy-carbonylamino, 2-halogeno-lower alkoxycarbonylamino, carbamoylamino, guanidinocarbonylamino, sulphoamino, azido, carboxyl, lower alkoxycarbonyl, cyano, sulpho, hydroxyl, lower alkoxycarbonyloxy, 2-halogeno-lower alkoxycarbonyloxy, lower alkoxy, phenyloxy and halogeno, and R^{III} represents hydrogen, or n represents 1, R^I and R^{II} each represents a member selected from the group consisting of halogeno and lower alkoxycarbonyl, and R^{III} represents hydrogen or n represents 1 and each of the groups R^I, R^{II} and R^{III} represent lower alkyl, $R_1{}^b$ is hydrogen, and R_2 is a member selected from the group consisting of hydrogen, tert-butyl, 2,2,2-trichloroethyl, 2-iodoethyl, 2-chloroethyl or 2-bromoethyl, phenacyl, 4-methoxybenzyl, or

4-nitrobenzyl, diphenylmethyl, 4,4'-dimethyl-diphenylmethyl, acetoxymethyl or pivaloyloxymethyl, and alkali metal salts, alkaline earth metal salts, or an ammonium salt formed with ammonia, lower alkylamine, benzylamine, pyridine, collidine, or quinoline.

4,458,070

PROCESS FOR THE MANUFACTURE OF CRYSTALLINE SODIUM CEFOPERAZONE

Susumu Nakanishi, Itayamaazani, Japan, assignor to Pfizer Inc., New York, N.Y.

Filed Jul. 19, 1982, Ser. No. 399,400
Int. Cl.³ C07D *501/36*; A61K *31/545*
U.S. Cl. 544—27 **5 Claims**

1. A process for the manufacture of crystalline sodium cefoperazone essentially free of residual organic solvents which comprises the steps of combining an aqueous acetone solution containing from about 3 to 30 percent (w/v) of sodium cefoperazone with about a four-fold volume (v/v) of a solution of acetone-methylene chloride (95:5, v/v) at a temperature of about 5°—40° C.; and separating and drying the resulting crystalline sodium cefoperazone.

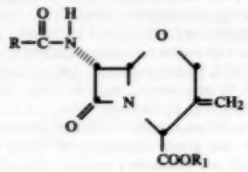
4,458,071

PROCESS FOR 1-OXA-β-LACTAMS

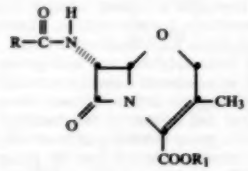
David A. Hall, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 16, 1982, Ser. No. 442,080
Int. Cl.³ C07D *498/04*
U.S. Cl. 544—90 **9 Claims**

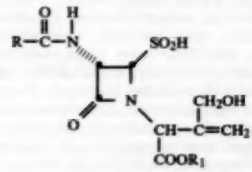
1. A process for preparing a compound of the formula



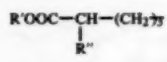
and the isomer thereof of the formula



which comprises mixing at a temperature between about −25° C. and about 0° C. in an inert organic solvent between about 1 mole and about 2.5 moles of lead tetraacetate per mole of an azetidin-2-one sulfinic acid of the formula



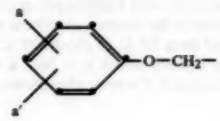
where in the above formulas R is hydrogen, C_1–C_4 alkyl, or an α-(protected amino)-4-carboxybutyl group of the formula



wherein
R′ is a carboxy-protecting group and
R″ is a protected amino group; or R is a group represented by the formula

wherein R‴ is thienyl, furyl, tetrazolyl, 1,4-cyclohexadienyl, cyclohexenyl, phenyl, or a substituted phenyl group of the formula

wherein
a and a′ independently are hydrogen, C_1–C_4 alkyl, fluoro, chloro, protected amino, protected aminomethyl, protected carboxy, protected carboxymethyl, carbamoyl, C_1–C_4 alkoxy, or protected hydroxy;
Q is hydrogen, protected amino, protected carboxy, or protected hydroxy;
or R is an aryloxymethyl group of the formula



wherein
a and a′ have the same meanings as defined above;
or R is an alkoxy or substituted alkoxy group represented by the formula

wherein
R⁗ is C_1–C_5 alkyl, C_3–C_6 cycloalkyl, benzyl, benzyl substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, or chloro;
and R_1 is a carboxy-protecting group.

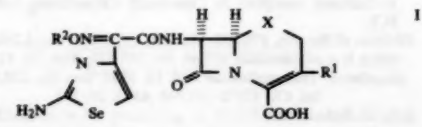
4,458,072

ACYL DERIVATIVES

Roland Reiner, Basel, and Urs Weiss, Pratteln, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sep. 28, 1981, Ser. No. 305,870
Int. Cl.³ C07D *51/56*; A61K *31/545*
U.S. Cl. 544—22 **20 Claims**

1. A compound of the formula



I

wherein R^1 is hydrogen, methyl, methoxy, chlorine, the group

—CH_2Y wherein Y is selected from acetoxy, carbamoyloxy, a group of the formula

wherein R^4 is hydrogen or carbamoyl or the group —SR^5 wherein R^5 is a 5 or 6 membered heterocyclic ring selected from the group consisting of tetrazolyl, triazolyl, thiadiazolyl or triazinyl being substituted or unsubstituted by lower alkyl, halogen, hydroxy and/or oxo, R^2 is hydrogen, lower alkyl or lower alkyl substituted by $COOR^3$, wherein R^3 is hydrogen, a cation of a base or a readily hydrolyzable ester selected from lower alkanoyloxyalkyl esters, lower alkoxycarbonyloxyalkyl esters, lactonyl esters, lower alkoxymethyl esters, alkanoylaminomethyl esters, benzyl ester and cyanomethyl esters, and X is sulfur, oxygen or one of the groups —SO— and —SO_2— and the readily hydrolyzable esters selected from lower alkanoyloxyalkyl esters, lower alkoxycarbonyloxyalkyl esters, lactonyl esters, lower alkoxymethyl esters, alkanoylaminomethyl esters, benzyl ester and cyanomethyl esters, readily hydrolyzable ethers selected from lower alkanoyloxyalkyl ethers, lower alkoxycarbonyloxyalkyl ethers, lactonyl ethers lower alkoxymethyl ethers and lower alkanoylaminomethyl ethers and salts thereof and hydrates of the compounds of formula I or of their esters, ethers and salts.

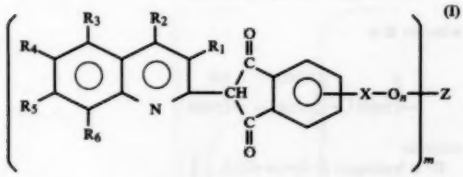
4,458,073

QUINOPHTHALONIC DYES CONTAINING SILANE GROUPS AND PROCESS FOR PREPARING SAME

Antonio Marraccini, Novara; Marcello Pieroni, Milan; Antonio Pasquale, Novara, and Luigi Balducci, Pavia, all of Italy, assignors to Montefluos S.p.A., Milan, Italy

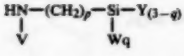
Filed Jan. 17, 1983, Ser. No. 458,197
Claims priority, application Italy, Jan. 18, 1982, 19152 A/82
Int. Cl.³ C09B 25/00
U.S. Cl. 546—14 **18 Claims**

1. A compound of the formula (I):



(I)

wherein R_1 is a hydrogen atom or a hydroxyl group; R_2, R_3, R_4, R_5 and R_6 may be equal or different and represent a hydrogen atom, a halogen, a nitro group, an alkyl group or an alkoxy group C_1–C_4; the groups (R_3–R_4) or (R_5–R_6), taken together, may represent furthermore a benzene nucleus; X is a carbon atom with n=1, or a sulphur atom with n=2; n and m are integers selected from 1 and 2; Z represents a silane compound having formula (II):



(II)

in which W is an alkyl group having up to 4 carbon atoms, or a phenyl group; q is an integer selected from 0 and 1; p is an integer ranging from 3 to 5; V is a hydrogen atom or a group—$(CH_2)_2$—NH_2, —C_6H_4—NH_2, —$(CH_2)_2$—C_6H_4—NH_2; Y represents an alkoxy group or a hydroxyl group; Z being bond by an aminic bridge derived from one of the aminic groups present in formula (II).

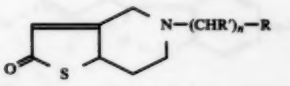
4,458,074

PROCESS FOR THE PREPARATION OF 5,6,7,7A-TETRAHYDRO-4H-THIENO[3,2-C]PYRIDIN-2-ONES

André Bouscuet, , assignors to Sanofi, Toulouse, France

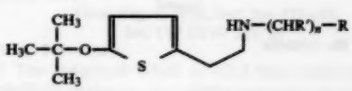
Filed Jun. 29, 1982, Ser. No. 393,381
Claims priority, application France, Jun. 30, 1981, 81 13067
Int. Cl.³ C07D 495/04
U.S. Cl. 546—114 **6 Claims**

1. A process for the preparation of a 5,6,7,7a-tetrahydro-4H-thieno [3,2-c]pyridin-2-one of the formula:



(I)

in which R is a hydrogen atom, phenyl, or phenyl substituted by at least one halogen atom, lower alkyl radical, lower alkoxy radical, nitro group, carboxyl group or alkoxycarbonyl radical, R′ is a hydrogen atom or lower alkyl radical, and n is 0 or an integer of from 1 to 4, which comprises reacting a compound of the formula:



(V)

in which R, R′ and n are as hereinbefore described, with formaldehyde, and then treating the resulting compound with dry hydrogen chloride.

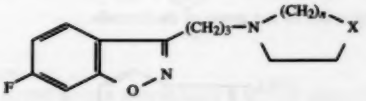
4,458,075

6-FLUORO-3-[3-(1-HETEROCYCLO)PROPYL]-1,2-BENZISOXAZOLES

Larry Davis, Sergeantsville, and Joseph T. Klein, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Apr. 9, 1982, Ser. No. 366,245
Int. Cl.³ C07D 413/06
U.S. Cl. 546—198 **23 Claims**

1. A compound of the formula



wherein X is CR_1R_2 wherein R_1 is loweralkyl, phenyl or phenylloweralkyl and R_2 is hydrogen, cyano, loweralkylcarbonyl, phenylcarbonyl in which the phenyl group is substituted by halogen, or a group of the formula

wherein R_3 is loweralkyl, $CHZR_4$ wherein Z is O or S and R_4 is hydrogen or phenyl substituted by trifluoromethyl or one or two halogen groups, $CHNR_5R_6$ wherein R_5 is hydrogen or phenyl and R_6 is phenylcarbonyl or loweralkylcarbonyl; n is 1, 2, or 3; an optical antipode or a pharmaceutically acceptable acid addition salt thereof.

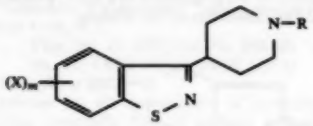
4,458,076

3-(4-PIPERIDINYL)-1,2-BENZISOTHIAZOLES

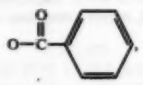
Joseph T. Strupczewski, Flemington, N.J., assignor to Hoechst-Roussel Pharmaceuticals, Somerville, N.J.

Filed May 31, 1983, Ser. No. 499,583
Int. Cl.³ C07D 417/04; A61K 31/425
U.S. Cl. 546—199 **24 Claims**

1. A compound of the formula

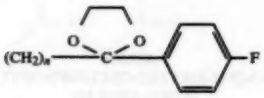


wherein R is hydrogen, loweralkyl, loweralkenyl, cycloalkyl-loweralkyl, phenylloweralkyl, hydroxy, diloweralkyamino-loweralkyl, cyano, cyanomethyl,

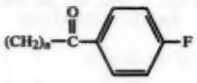


a group of the formula

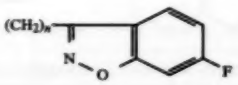
wherein R^1 is hydrogen, loweralkyl or a group of the formula OR^2 wherein R^2 is phenyl or benzyl; a group of the formula



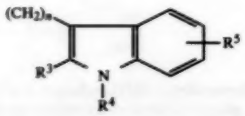
wherein n is 2 or 3; a group of the formula



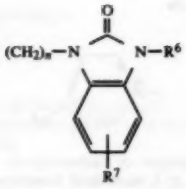
wherein n is 2 or 3; a group of the formula



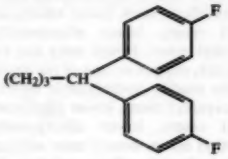
wherein n is 2 or 3; a group of the formula



wherein R^3 and R^4 are each independently hydrogen or loweralkyl, R_5 is hydrogen, halogen or loweralkyl, and n is 2 or 3; a group of the formula



wherein R^6 is hydrogen or loweralkyl, R^7 is hydrogen, halogen or loweralkyl, and n is 2 or 3; or a group of the formula



X is hydrogen, halogen, loweralkyl, loweralkoxy or hydroxy; and m is 1 or 2; the optical antipodes thereof; or pharmaceutically acceptable acid addition salts thereof.

4,458,077

HETEROCYCLIC ANTI-ULCER AGENTS

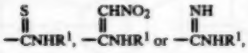
John R. Potoski, Pottstown, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Nov. 22, 1982, Ser. No. 443,423
Int. Cl.³ C07D 277/30, 307/54, 211/34
U.S. Cl. 548—197 **4 Claims**

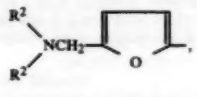
1. A compound having the formula:

$$Ar—(CH_2)_m—X—(CH_2)_n—ONHR$$

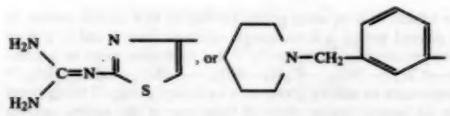
wherein R is



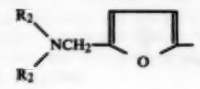
wherein
R^1 is hydrogen or lower alkyl;
X is O or CH_2;
m=0 or 1;
n=2 or 3; and,
Ar is a moiety selected from the group



wherein R^2 is hydrogen or lower alkyl,



with the proviso that when Ar is



and X is CH_2, then R is other than

and the pharmacologically acceptable salts thereof.

4,458,078

OXAZOLE DERIVATIVES

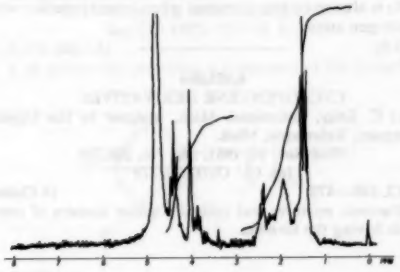
Yoshihiko Kitaura, Sakurai; Osamu Nakaguchi, Toyonaka; Keiji Hemmi; Matsuhiko Aratani, both of Suita; Hidekazu Takeno, Tenri; Satoshi Okada, Takatsuki; Hirokazu Tanaka; Masashi Hashimoto, both of Takarazuka; Yoshio Kuroda, Takatsuki; Eiko Iguchi, Osaka; Masanobu Kohsaka, Sakai; Hatsuo Aoki, Ikeda, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan

Division of Ser. No. 229,072, Jan. 28, 1981, Pat. No. 4,349,466, which is a continuation-in-part of Ser. No. 201,241, Oct. 27, 1980, Pat. No. 4,322,341, which is a continuation-in-part of Ser. No. 171,024, Jul. 22, 1980, abandoned, which is a continuation-in-part of Ser. No. 149,441, May 13, 1980, abandoned, which is a continuation-in-part of Ser. No. 147,710, May 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 110,020, Jan. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 093,523, Nov. 13, 1979, Pat. No. 4,311,640. This application May 13, 1982, Ser. No. 377,841

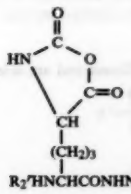
Claims priority, application United Kingdom, Nov. 14, 1978, 44346/78; Jul. 31, 1979, 7926605; Oct. 11, 1979, 7935401; Oct. 15, 1979, 7935730; Oct. 17, 1979, 7936000; Oct. 29, 1979, 7937343

Int. Cl.³ C07D *85/34*

U.S. Cl. 548—227 **2 Claims**



1. A compound of the formula:



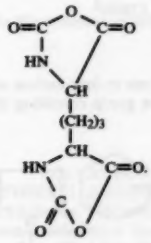
$R_2'HNCHCONHNHY$

wherein

R_2' is amino protective group and

Y is hydrogen or amino protective group.

2. A compound of the formula:



4,458,079

SULFUR-CONTAINING IMIDAZOLES

Richard A. Partyka, Liverpool, and Thomas W. Hudyma, Manlius, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Aug. 8, 1980, Ser. No. 176,422

Int. Cl.³ C07D *233/60*

U.S. Cl. 548—341 **9 Claims**

1. The compound which is 1-[2,2-bis(4-methoxybenzylthio)ethyl]-1H-imidazole, or a pharmaceutically acceptable acid addition salt thereof.

4,458,080

IMIDAZOLINE DERIVATIVES

Günther Boehmke, Leverkusen, Fed. Rep. of Germany; Klaus-Dieter Bode, deceased, late of Odenthal, Fed. Rep. of Germany (by Selma Bode, sole heiress), and Wilfried Kortmann, Hagen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,630

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1981, 3137044

Int. Cl.³ C07D *233/18*

U.S. Cl. 548—354 **2 Claims**

1. An imidazoline derivative of the formula

in which

R_1, R_2 and R_3 each independently is C_1–C_{19}-alkyl of C_{2-19}-alkenyl,

m and n each independently is 2 or 3, and $A^{\ominus}$ is an anion.

4,458,081

5-AROYL 1,2-DIHYDRO-3H-PYRROLO[1,2-A]PYRROLE-1,1-DECARBOXYLATES

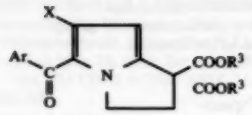
Joseph M. Muchowski, Sunnyvale, Calif., and Robert Greenhouse, Mexico City, Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 198,552, Oct. 20, 1980, Pat. No. 4,347,186. This application Jun. 11, 1982, Ser. No. 387,564

Int. Cl.³ C07D *471/04*

U.S. Cl. 548—453 **2 Claims**

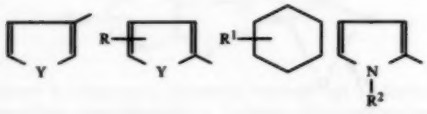
1. A compound of the formula


(II)

wherein:

X is hydrogen or lower alkyl of one to four carbon atoms;

Ar is a moiety selected from the group consisting of


(IA), (IB), (IC) and (ID)

in which:

Y is oxygen or sulfur;

R is hydrogen, methyl, chloro, or bromo;

R^1 is hydrogen, lower alkyl of one to four carbon atoms, lower alkoxyl of one to four carbon atoms, carboxyl, lower alkoxycarbonyl in which the alkoxy group has one to four carbon atoms, lower alkylcarbonyl in which the alkyl group has one to four carbon atoms, fluoro, chloro or bromo;

R^2 is hydrogen or lower alkyl of one to four carbon atoms; and each R^3 is independently hydrogen or lower alkyl of one to four carbon atoms.

4,458,082

METHOD FOR RECOVERING INDICINE-N-OXIDE

Fred E. Boettner, Huntingdon Valley, Pa., assignor to Polysciences, Inc., Warrington, Pa.

Filed Aug. 23, 1982, Ser. No. 410,632

Int. Cl.³ C07D *209/96*

U.S. Cl. 548—453 **4 Claims**

1. In a process of recovering indicine-N-oxide from *Heliotropium indicum*, the improvement which comprises water extracting the plant material thereby extracting the indicine-N-oxide in aqueous solution, then adsorbing the indicine-N-oxide from the aqueous extract, whereafter the indicine-N-oxide is eluted from the adsorbent.

4,458,083

CYCLO PENTENE DERIVATIVES

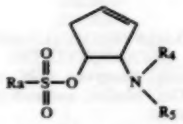
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 906,175, May 15, 1978, abandoned. This application Nov. 14, 1980, Ser. No. 206,787

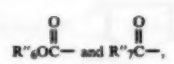
Int. Cl.³ C07D *207/18*

U.S. Cl. 548—478 **5 Claims**

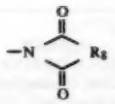
1. Racemic mixtures and optically active isomers of compounds having the formula



wherein Ra is selected from the group consisting of alkyl of from 1 to 8 carbon atoms, inclusive, halogenated alkyl of from 1 to 5 carbon atoms, inclusive, and 1 to 3 halogen atoms, inclusive, and aryl of from 6 to 20 carbon atoms, inclusive, and R_4 and R_5 are the same or different and are selected from the group consisting of hydrogen,

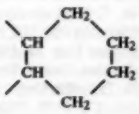


wherein R''_6 and R''_7 are selected from the group consisting of alkyl of from 1 to 8 carbon atoms, inclusive, halogenated alkyl of from 1 to 5 carbon atoms, inclusive, and 1 to 3 halogen atoms, inclusive, aralkyl of from 7 to 20 carbon atoms, inclusive, and substituted aralkyl of from 7 to 20 carbon atoms, inclusive, and when taken together with the nitrogen atom form the group



wherein R_8 is selected from (a) the group consisting of

wherein R_9, R_{10}, R_{11} and R_{12} are selected from the group consisting of alkyl of from 1 to 5 carbon atoms, inclusive (b)



(c) orthointerphenylene, and (d) substituted orthointerphenylene; and salts formed with the anions of protonic acids when R_4 and R_5 are both hydrogen, with the proviso that one of R_4 and R_5 is always hydrogen except when joined together with the nitrogen atom.

4,458,084

CYCLOPENTENE DERIVATIVES

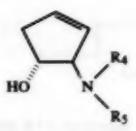
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 14, 1981, Ser. No. 206,788

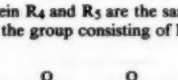
Int. Cl.³ C07D *207/18*

U.S. Cl. 548—478 **14 Claims**

1. Racemic mixtures and optically active isomers of compounds having the formula

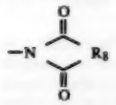


wherein R_4 and R_5 are the same or different and are selected from the group consisting of hydrogen,

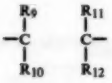


wherein R''_6 and R''_7 are selected from the group consisting of

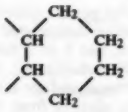
alkyl of from 1 to 8 carbon atoms, inclusive, halogenated alkyl of from 1 to 5 carbon atoms, inclusive, and 1 to 3 halogen atoms, inclusive, and aralkyl of from 7 to 20 carbon atoms, inclusive, substituted aralkyl of from 7 to 20 carbon atoms, inclusive, and when taken together with the nitrogen atom form the group



wherein R_8 is selected from (a) the group consisting of



wherein R_9, R_{10}, R_{11} and R_{12} are selected from the group consisting of alkyl of from 1 to 5 carbon atoms, inclusive (b)



(c) orthointerphenylene, and (d) substituted orthointerphenylene; and salts formed with the anions of protonic acids when R_4 and R_5 are both hydrogen, with the proviso that one of R_4 and R_5 is always hydrogen except when joined together with the nitrogen atom.

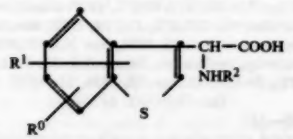
4,458,085

PREPARATION OF 3-BENZOTHIENYLGLYCINES

George W. Huffman, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 12, 1983, Ser. No. 484,127
Int. Cl.³ C07D *333/60, 333/64*
U.S. Cl. 549—51 **10 Claims**

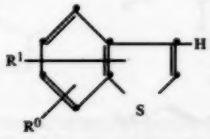
1. A process for preparing a compound of the formula



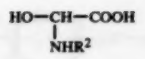
wherein:

R^0 and R^1 independently are hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, halo, nitro, C_1–C_4 alkanoylamino or C_1–C_4 alkylsulfonylamino;

R^2 is an amine protecting group; comprising reacting a benzothiophene of the formula



with an α-hydroxyglycine of the formula



in the presence of trifluoroacetic acid.

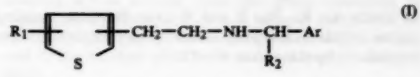
4,458,086

PROCESS FOR THE PREPARATION OF 2-(THIENYL-2)-AND 2-(THIENYL-3)-ETHYLAMINES

Isaac Chekroun, Toulouse, and Alain Heymes, Sisteron, both of France, assignors to Sanofi, Toulouse, France

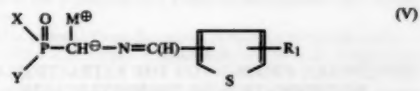
Filed Jun. 29, 1982, Ser. No. 393,388
Claims priority, application France, Jun. 30, 1981, 81 13064
Int. Cl.³ C07D *333/00*
U.S. Cl. 549—74 **11 Claims**

1. Process for the preparation of 2-(thienyl-2)- and 2-(thienyl-3)-ethylamines of the general formula:



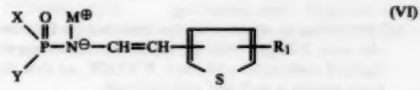
(I)

in which R_1, which is in the 2-, 3-, 4- or 5-position, is a hydrogen atom, a straight-chained or branched alkyl radical or a heterocyclic or non-heterocyclic aromatic radical, which is optionally mono- or polysubstituted, or R_1 is an alkoxy radical, a halogen atom or a nitro, carboxyl, cyano or amino group; the aminoethyl chain is in the 2- or 3-position of the tiophene nucleus; R_2 is a hydrogen atom or a straight-chained or branched alkyl radical or a heterocyclic or non-heterocyclic aromatic radical, which is optionally mono- or polysubstituted; and Ar is a heterocyclic or non-heterocyclic aromatic radical, which is optionally mono- or polysubstituted, which comprises the steps of heating a carbanion of the general formula:



(V)

in which M^+ is an alkali or alkaline earth metal, X and Y, which may be the same or different, are alkyl, aryl, alkoxy, aryloxy, dialkylamino or diarylamino radicals and R_1 has the same meaning as above, so as to form a compound of the general formula:

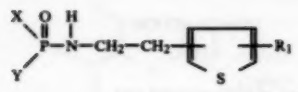


(VI)

in which M^+R_1, X and Y have the same meanings as above, treating with water so as to yield, a compound of the general formula:

(VII)

in which R_1, X and Y have the same meanings as above, reduction of which gives a compound of the general formula:

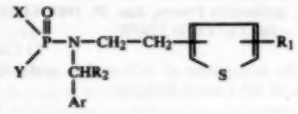


(VIII)

in which R_1, X and Y have the same meanings as above, reacting the compound formed with a base of the general formula $B'^-M'^+$ wherein B'^- is hydrogen, amide, dialkylamide, alkyl, alkylate or hydroxy, M'^+ is an alkali or alkaline earth metal, and reacting with a halogen derivative of the general formula:

$$Ar—CHX—R_2 \quad (IX)$$

in which Ar and R_2 have the same meanings as above and X is a halogen atom, to give a compound of the general formula:



(X)

in which Ar, R_1, R_2, X and Y have the same meanings as above, which is finally converted into a compound of general formula (I) by the action of an acid.

4,458,087

ORGANOSILICON COMPOUNDS

Roy E. McAlister, 5285 N. Red Rock Dr., Phoenix, Ariz. 85018

Filed Oct. 16, 1981, Ser. No. 312,073

Int. Cl.³ C07C *7/08*

U.S. Cl. 556—465 **55 Claims**

1. Monosilatetrafluoroethylene of the formula $SiCF_4$.

4,458,088

CONTINUOUS PROCESS FOR THE EXTRACTION AND ESTERIFICATION OF CARBOXYLIC ACID

Harley F. Hardman, Lyndhurst; John G. Frye, Jr., Euclid, and Terry J. Mazanec, Solon, all of Ohio, assignors to The Standard Oil Company (Sohio), Cleveland, Ohio

Filed Apr. 1, 1982, Ser. No. 364,387

Int. Cl.³ C07C *67/10*

U.S. Cl. 560—96 **39 Claims**

1. A continuous process for the production of alkyl esters from carboxylic acids comprising:

(a) contacting an aqueous stream containing a first carboxylic acid, RCO_2H, with an organic stream comprising a reactant carboxylic acid ester, $R''CO_2R'$, so that the organic stream is enriched with RCO_2H;

(b) separating the aqueous stream from the RCO_2H enriched organic stream;

(c) contacting the organic stream of (b) with a catalyst to obtain a product carboxylic acid ester, RCO_2R', and a second carboxylic acid, $R''CO_2H$;

(d) separating the product ester, RCO_2R', from the second carboxylic acid, $R''CO_2H$;

(e) esterifying the second carboxylic acid of (d), $R''CO_2H$, to obtain the reactant ester, $R''CO_2R'$; and

(f) recycling the reactant ester, $R''CO_2R'$, of (e) to (a);

wherein R is aliphatic or aromatic, R' is alkyl, and R'' is aromatic or aliphatic with at least about 4 carbon atoms.

4,458,089

CYCLOPENTENE DERIVATIVES

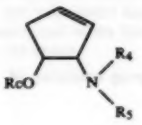
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 14, 1980, Ser. No. 206,800

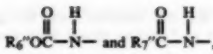
Int. Cl.³ C07D *207/18*

U.S. Cl. 560—115 **18 Claims**

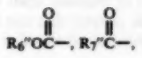
1. Racemic mixtures and optically active isomers of a compound having the formula



wherein Rc is selected from the group consisting of amino, dialkylamino,



wherein R''_6 and R''_7 are selected from the group consisting of alkyl of from 1 to 8 carbon atoms, inclusive, halogenated alkyl of from 1 to 5 carbon atoms, inclusive, and 1 to 3 halogen atoms, inclusive, aralkyl of from 7 to 20 carbon atoms, inclusive; and R_4 and R_5 are the same or different and are selected from the group consisting of hydrogen, alkyl of from 1 to 2 carbon atoms, inclusive.



with the proviso that the groups Rc and NR_4R_5 are never simultaneously the same and one of R_4 and R_5 is always hydrogen.

4,458,090

METHOD OF PRODUCING CYCLOPROPANECARBOXYLIC ACIDS AND ESTERS

Mori Fumio, Kurashiki; Omura Yoshiaki, Mitsu; Nishida Takashi, Kurashiki, and Itoi Kazuo, Kitakanbara, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Division of Ser. No. 840,279, Oct. 7, 1977, abandoned, which is a division of Ser. No. 705,176, Jul. 14, 1976, abandoned. This application Oct. 15, 1981, Ser. No. 311,896

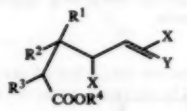
Claims priority, application Japan, Jul. 22, 1975, 50-89507; Dec. 29, 1975, 50-158047; Apr. 30, 1976, 51-50595

Int. Cl.³ C07C *69/743*

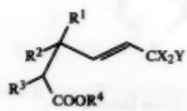
U.S. Cl. 560—124 **22 Claims**

1. A method of producing a cyclopropanecarboxylic acid derivative which comprises:

treating an ester selected from the group consisting of esters of general formula III, esters of general formula V and esters of general formula VIII:



[III]



[V]

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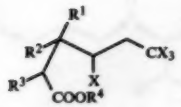
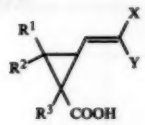
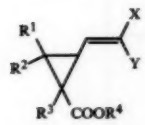


[VIII]

or a mixture of two or more of such esters with a basic reagent, and then, with an acid reagent to obtain a cyclopropanecarboxylic acid derivative comprising a cyclopropanecarboxylic acid of general formula IX and/or a cyclopropanecarboxylic acid ester of general formula IV:

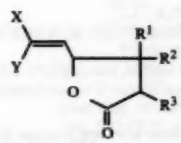


[IX]



[IV]

and a γ-lactone derivative of general formula I:

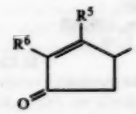


[I]

and, thereafter,

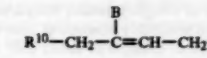
(i) treating said γ-lactone derivative I together with said cyclopropanecarboxylic acid derivative with a hydrogen halide of general formula HX and an alcohol of general formula R^4OH, recovering a cyclopropanecarboxylic acid ester of general formula IV from the reaction mixture, and treating an ester of general formula III concomitantly produced with a basic reagent to obtain an additional amount of cyclopropanecarboxylic acid derivative comprising a cyclopropanecarboxylic acid of general formula IX and/or an ester thereof IV,

wherein the above formulas, R^1 and R^2, respectively, mean an alkyl group of 1 to 5 carbon atoms; R^3 is a member selected from the group consisting of hydrogen, alkyl groups of 1 to 5 carbon atoms and cycloalkyl groups of 3 to 8 carbon atoms; R^4s are the same or different and each means an alcohol residue selected from the group consisting of alkyl, cycloalkyl, alkenyl, cycloalkenyl, alkynyl,



wherein R^5 is selected from the group consisting of hydrogen and methyl, R^6 is selected from the group consisting of alkenyl, alkadienyl, alkynyl and benzyl;

wherein R^7 is selected from the group consisting of hydrogen, ethynyl and cyano, R^8 is selected from the group consisting of hydrogen, halogen and alkyl, R^9 is selected from the group consisting of halogen, alkyl, alkenyl, alkynyl, benzyl, thenyl, furylmethyl, phenoxy and phenylthio, R^8 and R^9, taken together, may form a polymethylene chain which may be interrupted by a sulfur or oxygen atom, Q is a member selected from the group consisting of —O—, —NH—, —S— and —CH=CH—, n is 1 or 2; A—CH_2— wherein A is selected from the group consisting of phenoxyphenyl, phthalimido, thiophthalimido, di- or tetrahydrophthalimido and dialkylmaleimido; and



wherein R^{10} is selected from the group consisting of phenyl, thienyl and furyl; B is a halogen atom; Y is selected from the group consisting of X and —CHX—CH_3; and Xs are the same or different and each means a halogen atom.

4,458,091

PROSTAGLANDINS

Robert L. Jones, and Norman H. Wilson, both of Edinburgh, Scotland, assignors to National Research Development Corporation, London, England

Division of Ser. No. 205,964, Sep. 3, 1980, Pat. No. 4,368,332. This application Sep. 30, 1982, Ser. No. 431,558

Claims priority, application United Kingdom, Jan. 5, 1979, 7900368

Int. Cl.³ C07C 57/26, 69/608

U.S. Cl. 562—502 **21 Claims**

1. A compound which is a bicyclo[2,2,1]hept-2Z-ene substituted at the 5-position by a group of the formula —R^1—COQ, where

R^1 is selected from the group consisting of C_4–C_8 alkyl;

—CH_2—CH=CH—$(CH_2)_m$—, where m is an integer from 1 to 5;

—CH_2—CH_2—CH=CH—$(CH_2)_n$—, where n is an integer from 0 to 4;

—X—$(CH_2)_p$—, where p is an integer from 3 to 7;

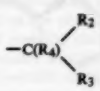
—CH_2—X—$(CH_2)_q$—, where q is an integer from 2 to 6;

—CH_2—CH_2—X—$(CH_2)_m$—; and

—CH=CH—$(CH_2)_3$—; wherein X is O or S;

COQ is carboxy, a physiologically acceptable carboxylate salt, a branched or unbranched C_1–C_5 alkyl ester or $CONHSO_2CH_3$;

and wherein said bicyclo[2,2,1]heptene is substituted at the 6-position by a grouping of the formula



in which

R_4 is selected from the group consisting of unsubstituted C_1–C_{10} branched or unbranched aliphatic hydrocarbon residues and C_1–C_{10} branched or unbranched aliphatic hydrocarbon residues substituted by Ar, —OAr, or —SAr, where Ar is a phenyl or pyridyl residue which is unsubstituted or substituted by one or more substituents selected from the group consisting of halogen, halogen

substituted C_1–C_5 branched or unbranched alkyl groups, sulphonamido groups, amino groups, hydroxy and C_1–C_{10} alkoxy groups;

R_2 represents hydrogen and R_3 represents a hydroxy group, or R_2 and R_3 together represent the oxygen atom of a carbonyl group.

4,458,092

HIGHLY ACTIVE CATALYSTS FOR METHANOL AMINATION

Michel Deeba, Emmaus, and Robert N. Cochran, West Chester, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 29, 1982, Ser. No. 344,164
Int. Cl.³ C07C 85/06
U.S. Cl. 564—479 **9 Claims**

1. In a process for producing methylamines from the reaction of methanol with ammonia in the presence of a catalyst, the method for improving methanol conversion rates which comprises reacting the methanol and ammonia under conversion conditions in the presence of a highly acidic, dehydrated aluminosilicate catalyst which irreversibly adsorbs at least 0.5 millimoles of ammonia per gram of catalyst at about 200° C., has a silicon to aluminum ratio of at least about 2.0, and has three dimensional intracrystalline pore channels of at least about 7 Angstroms.

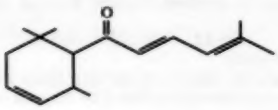
4,458,093

HEXADIENOYL CYCLOHEXENE DERIVATIVE

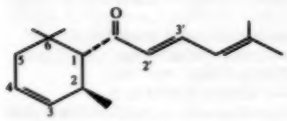
John B. Hall, Rumson; Joseph A. McGhie, Montclair, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed May 20, 1983, Ser. No. 496,801
Int. Cl.³ C07C 49/557
U.S. Cl. 568—378 **1 Claim**

1. A compound having the structure:



or an isomer thereof having a structure selected from the group consisting of:



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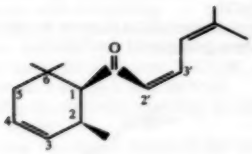

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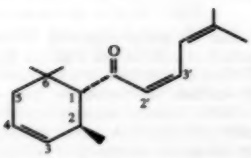

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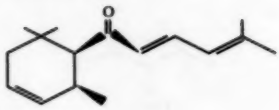
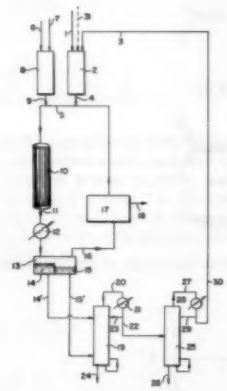


4,458,094

PROCESS FOR FORMING NITROPARAFFIN

Martin B. Sherwin, Potomac, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Jan. 22, 1982, Ser. No. 341,679
Int. Cl.³ C07C 76/02
U.S. Cl. 568—947 **10 Claims**



1. In a homogeneous gaseous phase nitration process for the formation of nitroparaffins by contacting in a reaction zone a hydrocarbon or mixture of hydrocarbons higher than methane, nitrogen peroxide and oxygen at elevated temperatures and at elevated pressures; cooling the reaction zone effluent; separating the resulting liquid phase effluent from the non-condensed gaseous effluent; separating the organic nitroparaffin containing phase from the liquid phase effluent; and recovering the nitroparaffin components; the improvement comprising contacting said hydrocarbon, nitrogen peroxide and oxygen reactants in said reaction zone in the presence of a small amount of C_2 to C_5 oxygenated hydrocarbon feed selected from alcohols, aldehydes, ketones, ethers and mixtures thereof.

4,458,095

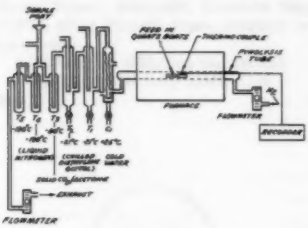
USE OF ZINC AND COPPER (I) SALTS TO REDUCE SULFUR AND NITROGEN IMPURITIES DURING THE PYROLYSIS OF PLASTIC AND RUBBER WASTE TO HYDROCARBONS

Robert C. Wingfield, Jr.; Jacob Braslaw, both of Southfield, and Roy L. Gealer, West Bloomfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1982, Ser. No. 429,369
Int. Cl.³ C07C 7/00, 7/16
U.S. Cl. 585—241 **10 Claims**

1. An improvement in a process for the pyrolytic conversion of waste selected from rubber and plastic to hydrocarbon products which results in reduced levels of nitrogen and sulfur impurities in said products, the improvement comprising pyrolyzing said waste at a temperature of between about 400° C. and about 700° C. in a pyrolysis zone through which inert gas

is fowing in the presence of at least about 1 weight percent, based on the weight of said waste, of zinc or copper (I) salts for



a time sufficient to pyrolyze said waste to char and volatile hydrocarbon- containing products.

4,458,096

PROCESS FOR THE PRODUCTION OF ETHYLENE AND PROPYLENE

David J. Phillips, and Jerome L. Glazer, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 26, 1983, Ser. No. 498,360

Int. Cl.³ C07C *5/333, 11/04, 11/06*

U.S. Cl. 585—302 **5 Claims**

1. A process for producing ethylene and propylene in high selectivity from feed streams containing ethane and propane comprising:

(a) separating a feed stream into an ethane fraction and a propane fraction, if not already separated;

(b) passing said ethane fraction through a steam cracking unit at a temperature from about 750° to 930° C., thereby forming an ethylene-rich stream;

(c) passing said propane fraction through a dehydrogeration unit over a suitable catalyst at a temperature from about 425° to 815° C., thereby forming a propylene-rich stream;

(d) adjusting the pressure of said propylene-rich stream to about equal to that of said ethylene-rich stream;

(e) combining said ethylene-rich and propylene-rich streams, thereby forming a combined ethylene/propylene stream;

(f) initially compressing and cooling said combined ethylene/propylene stream, thereby removing impurities and by-products, and producing a refined stream;

(g) subjecting said refined stream to low temperature fractionation to effect the recovery of ethylene and propylene and unreacted ethane and propane;

(h) recycling said unreacted ethane and propane back to the steam cracking and dehydrogenation units respectively.

4,458,097

CONVERSION OF CERTAIN HYDROCARBONS USING DIVALENT-COPPER-CONTAINING ZSM-5 TYPE CATALYST

Daniel C. Garska, St. Albans, W. Va., and James S. Ritscher, Ossining, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 30, 1982, Ser. No. 373,728

Int. Cl.³ C07C *3/03, 3/20*

U.S. Cl. 585—415 **15 Claims**

1. A low severity process for the preparation of a benzene-toluene-xylenes enriched stream containing minimal monoolefins and diolefins, from a feed stream comprising a by-product effluent of a process for the pyrolitic cracking of hydrocarbons to produce light olefins or diolefins, said by-product effluent stream containing olefins, diolefins, or a C_4–C_{9+} fraction said process comprising contacting said by-product effluent stream, under low severity conditions including a temperature within the range of about 300°–700° C., a pressure within the range of about 0 to 100 atmospheres, and a weight hourly space velocity within the range of about 0.1 to about 20, with a catalyst essentially consisting of a divalent-copper-containing ZSM-5 type catalyst, said catalyst comprising an aluminosilicate zeolite of the ZSM-5 type, said zeolite prior to copper exchange having a silica/alumina ratio of between about 20 and 100, and an x-ray diffraction pattern having at least the d-spacings set forth in the "X-Ray Diffraction Pattern" table above, the resulting divalent copper exchanged zeolite catalyst having the formula:

$$1.6\text{–}2.0\ Cu{+}{+} : O : 0\text{–}0.2\ M_{2/n}O : Al_2O_3 : 20\text{–}100\ SiO_2$$

wherein M is at least one cation other than Cu^{++}.

4,458,098

HYDRGCARBON DEHYDROGENATION METHOD AND NONACIDIC MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 207,852, Nov. 17, 1980, Pat. No. 4,374,046, which is a continuation-in-part of Ser. No. 46,884, Jun. 8, 1979, Pat. No. 4,238,365, which is a division of Ser. No. 884,310, Mar. 7, 1978, Pat. No. 4,190,521. This application Nov. 29, 1982, Ser. No. 445,381

Int. Cl.³ C07C *5/333, 2/54*; B01J *23/02, 23/06*

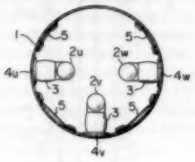
U.S. Cl. 585—660 **17 Claims**

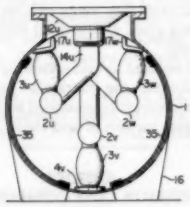
1. A method for dehydrogenating a dehydrogenable hydrocarbon in the presence of a hydrogen diluent comprising contacting said hydrocarbon at dehydrogenation conditions which include the limited presence of water in an amount of about 1 to about 5,000 wt. ppm, a temperature of about 700° F. to about 1200° F., a pressure of about 0.1 to about 10 atmospheres, an LHSV of about 1 to about 40 $hr.^{-1}$, and a hydrogen to hydrocarbon mole ratio of about 1:1 to about 20:1 with a porous carrier material containing four essential catalytic components, on an elemental basis of, (1) about 0.01 to about 2 wt % platinum metal; (2) about 0.05 to about 5 wt % nickel; (3) about 0.01 to about 5 wt % zinc and (4) from about 0.1 to about 5 wt % of an alkali metal or alkaline earth metal; wherein said platinum group, catalytically available nickel and zinc components are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group component is present in the elemental metallic state; and wherein substantially all of the catalytically available nickel component is present in the elemental metallic state or in the state which is reducible to the elemental metallic state under said hydrocarbon dehydrogenation conditions or in a mixture of these states.

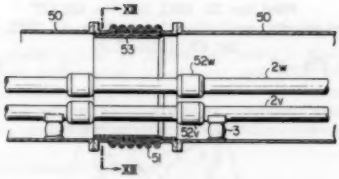
4,458,099
THREE-PHASE COMBINED TYPE GAS INSULATED ELECTRICAL APPARATUS

Susumu Takeuti; Minoru Sakaguchi; Takanobu Aoyama, and Kazuaki Oishi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 19, 1981, Ser. No. 245,513
Int. Cl.[3] H02G 5/06; H01B 9/06
U.S. Cl. 174—27 12 Claims







1. A three-phase combined type gas insulated electrical apparatus comprising:

a cylindrical metal sealed casing filled with an insulating gas,

three high voltage conductors for a three-phase alternating current arranged at positions corresponding to the apexes of a triangle having two sides of equal length and one side of a length which is different from that of said two sides,

insulating support means for supporting each of said high voltage conductors and electrically insulating said conductors from said sealed casing, and

eddy current conductor means of good electrical conductivity for passing an eddy current caused by a magnetic field having a component perpendicular to the surface of said sealed casing and induced by current flowing in said high voltage conductors, said eddy current conductor means being secured in the vicinity of the inner wall of said sealed casing and having a longitudinal gap at least in a portion thereof facing said one side of the triangle, whereby said eddy current conductor means is discontinuous circumferentially of said casing so as to be located in areas of the casing facing at least portions of said two sides of the triangle.

7. A three-phase combined type gas insulated electrical apparatus comprising:

a cylindrical sealed metal casing filled with an insulating gas,

three high voltage conductors for three-phase alternating current arranged at positions corresponding to apexes of a triangle within said sealed casing,

branch conductors for the respective three phases, each having an end thereof connected to a corresponding one of said high voltage conductors, said branch conductors being led out of said sealed casing in one direction,

insulating support means arranged substantially in parallel to the direction of leading of said branch conductors for respective phases, said insulating support means electrically insulating said high voltage conductors for respective phases from said sealed casing and securing said high voltage conductors to the inner wall of said sealed casing, and

eddy current conductors made of a material of good electrical conductivity for passing an eddy current, each of said eddy current conductors being secured between one of said insulating support means substantially aligned with said direction of leading of the branch conductors and the remaining two of said insulating support means, respectively, each of said eddy current conductors being secured in the vicinity of the inner wall of said sealed casing.

10. A three-phase combined type gas insulated electrical apparatus comprising:

a cylindrical sealed metal casing of aluminum filled with an insulating gas,

bellows means connected in series with said sealed casing,

three high voltage conductors for three-phase alternating current arranged at positions corresponding to apexes of a triangle within said sealed casing and within said bellows means,

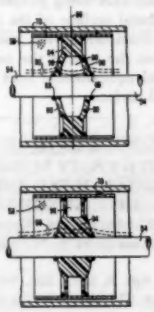
insulating support means for supporting and insulating electrically said high voltage conductors for respective phases from said sealed casing and said bellows means, and

an eddy current conductor arranged in the vicinity of the inner wall of said bellows means for passing an eddy current caused by a magnetic field having a component perpendicular to said bellows means, which is induced by current flowing in said high voltage conductors.

4,458,100
GAS INSULATED TRANSMISSION LINE WITH INSULATORS HAVING FIELD CONTROLLING RECESSES

Alan H. Cookson, Pittsburgh, Pa., and Bjorn O. Pederson, Chelmsford, Mass., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 267,949, May 28, 1981, abandoned.
This application May 6, 1983, Ser. No. 492,066
Int. Cl.[3] H02G 5/06; H01B 9/06
U.S. Cl. 174—28 6 Claims



1. A transmission line, comprising:

(a) a hollow outer conductor;

(b) an inner conductor adapted for connection to an energizing source and disposed within said outer conductor; and

(c) insulator means disposed between said inner and said outer conductors for insulatingly supporting said inner conductor within said outer conductor, said insulator means having a recess of a predetermined width and depth disposed adjacent and contiguous with one of said inner or outer conductors, the periphery of said recess comprising electrically insulating material and being devoid of any electrically conductive material thereon, said recess eliminating voids which are subject to high electrical stresses and which may be present at the conductor/insulator means interface along the portion of the one of said inner and outer conductors wherein said recess is located and reducing the electric field produced with the inner conductor is energized along the periphery of the portion of the other of said conductors opposite the location of said recess;

said predetermined width of the recess being sufficiently extensive to define two support legs having the requisite mechanism strength to support the inner conductor, and wherein the conductors are located along a first axis and the insulator means is located along a second axis, said first and second axes being perpendicular to each other, wherein said support legs are bent outwardly from the axis of the insulator means to thus shape electrical equipotential lines radially outwardly at the support legs.

3. A transmission line, comprising:

(a) a hollow outer conductor;

(b) an inner conductor adapted for connection to an energizing source and disposed within said outer conductor; and

(c) insulator means disposed between said inner and said outer conductors for insulatingly supporting said inner conductor within said outer conductor, said insulator means having a recess of a predetermined width and depth disposed adjacent and contiguous with one of said inner or outer conductors, the periphery of said recess comprising electrically insulating material and being devoid of any electrically conductive material thereon, said recess eliminating voids which are subject to high electrical stresses and which may be present at the conductor/insulator means interface along the portion of the one of said inner and outer conductors wherein said recess is located and reducing the electric field produced when the inner conductor is energized along the periphery of the portion of the other of said conductors opposite the location of said recess;

said predetermined width of the recess being sufficiently extensive to define two support legs having the requisite mechanical strength to support the inner conductor, and wherein the conductors are disposed along a first axis and the insulator means is disposed along a second axis, said first and second axes being perpendicular to each other and the peripheral surface of the insulator means at the opposite end from where the recess is located is bent outwardly from the axis of the insulator means to thus shape electrical equipotential lines radially outwardly at said peripheral surface.

4,458,101

GAS-INSULATED EPOXY BUSHING HAVING AN INTERNAL THROAT SHIELD AND AN EMBEDDED GROUND SHIELD

Alan H. Cookson, Pittsburgh, and Michael S. Yatsko, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 8, 1982, Ser. No. 366,626
Int. Cl.³ H01B *17/26, 17/36*
U.S. Cl. 174—31 R **5 Claims**

1. A gas-insulated bushing comprising:

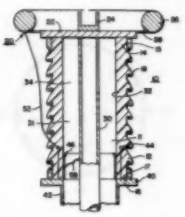
an elongated, hollow epoxy insulating shell having first and second longitudinal ends and a wall thickness;

an electrically conducting grounded mounting plate secured to said shell first end;

an elongated conductor centrally disposed within, and spaced-apart from, said shell;

terminal means secured to said shell second end and electrically connected to said conductor;

an insulating gas disposed within said shell and electrically insulating said conductor from said shell;



a ground shield cast within said shell wall adjacent said shell first end and extending longitudinally outward to contact said mounting plate, said ground shield being electrically grounded; and

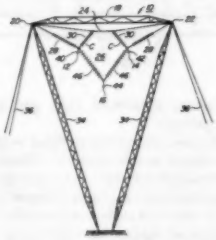
a throat shield secured to said mounting plate and extending longitudinally into the interior of said shell, said throat shield being electrically grounded and physically contacting the interior surface of said shell.

4,458,102

TRANSMISSION LINE COMPOSITE BEAM SUSPENSION ASSEMBLY

Herbert B. White, P.O. Box 939, Hudson, Quebec, Canada J0P 1H0

Filed Sep. 23, 1982, Ser. No. 421,837
Claims priority, application Canada, Mar. 17, 1982, 398620
Int. Cl.³ H02G *7/20*
U.S. Cl. 174—43 **8 Claims**



1. A suspension system for supporting a plurality of high voltage electrical conductors forming part of a transmission line in a predetermined spaced pattern relative to one another, comprising:

(a) means defining a pair of spaced primary support points;

(b) a rigid compression strut arranged to extend laterally between said pair of spaced primary support points;

(c) a tension member suspended below said compression strut and having its opposing ends operatively connected at said primary support points so as to apply compression forces lengthwise of the strut when the tension member is loaded;

(d) an array of insulators disposed below said tension member for supporting the plurality of electrical conductors in the predetermined spaced pattern relative to one another, said insulator array including opposing end insulator means connected at said primary support points and inter-

mediate insulator means connected to said tension member;

(e) said insulator array including first, second and third elements for supporting the electrical conductors at first, second and third points in an inverted Delta or triangle array;

(f) said first and second support elements being in horizontally spaced relation;

(g) the opposing end insulator means comprising first and second elongate insulators extending from said first and second support elements respectively, each to an associated one of said primary support points;

(h) the intermediate insulator means comprising a pair of elongated insulators each extending from a respective one of said first and second support elements upwardly and being connected to said tension member; so that the total loading imposed on said insulator array by the conductors is shared between said opposing end insulator means and said intermediate insulator means with the tension member thus bearing a portion of said total loading.

4,458,103

INSULATING JOINT FOR RUBBER OR PLASTIC INSULATED POWER CABLE

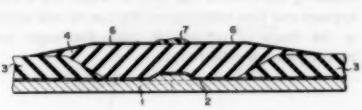
Shin-ichi Irie; Yasuhiro Yamashita, both of Ichihara; Takao Nakano, Yokohama, and Teruyoshi Tanabe, Ichihara, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1983, Ser. No. 472,940

Claims priority, application Japan, Mar. 10, 1982, 57-36636

Int. Cl.³ H02G *15/08, 15/188;* **H01B** *1/24*

U.S. Cl. 174—73 R **3 Claims**



1. An insulating joint for joining two rubber or plastic insulated power cables which are adjacent each other longitudinally, said cables having conductors which are joined at a joint portion, said insulating joint having an insulation shield means around an insulation layer covering said cable conductor joint portion,

the improvements wherein:

said insulation shield means of said cable joint comprises respective shield members longitudinally opposed to each other and having respective ends which are spaced from each other in the longitudinal direction of said cables; and

a layer having a high dielectric constant and a high volume resistivity is interposed therebetween in said longitudinal space, said layer with high dielectric constant and high volume resistivity comprising a mixture consisting of **100** parts by weight of a rubber or plastic as a base, **50** to **700** parts by weight of one or both of silicon carbide or zinc oxide, and **2** to **60** parts by weight of carbon black.

4,458,104

DIMENSIONALLY RECOVERABLE ARTICLES

Richard J. Penneck, Lechlade; David H. Thomas, Inkpen, and Allan J. Cox, Swindon, all of England, assignors to Raychem Limited, London, England

Filed Jun. 21, 1982, Ser. No. 390,456

Claims priority, application United Kingdom, Jun. 22, 1981, 8119243

Int. Cl.³ H02G *13/06;* **H01R** *4/00;* **B29C** *27/00;* **H01B** *13/06*

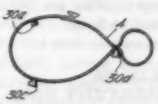
U.S. Cl. 174—88 R **36 Claims**

1. A dimensionally-recoverable sleeve or wrap-around sleeve having a wall provided with a plurality of locking elements located on the wall that are engagable with each other, or are engagable with corresponding locking elements located on a separate partition, to furcate the sleeve or wrap-around sleeve into a plurality of channels.

22. A furcated elongate substrate enclosed by a sleeve or wrap-around sleeve as claimed in claim 1.

23. A substrate as claimed in claim 22 which is an electrical cable.

28. A partition for furcating a hollow body, which comprises a wall portion having, at each of two opposed edges thereof, one or more locking elements arranged along each of the said edges, the locking elements being engagable with corresponding locking elements located on the body wall.



35. A method of enclosing part of an elongate substrate that furcates into a plurality of branches, which comprises positioning about the substrate a dimensionally-recoverable sleeve or wrap-around sleeve having a wall provided with a plurality of locking elements located on the wall that are engagable with each other or are engagable with corresponding locking elements located on a separate partition, engaging the locking elements on the wall with each other or with corresponding locking elements located on the partition to furcate the sleeve or wrap-around sleeve into a plurality of channels so that each channel encloses a branch of the substrate, and recovering the sleeve or wrap-around sleeve about the substrate.

4,458,105

CABLE PROTECTED AGAINST MOISTURE AND METHOD OF MAKING THE SAME

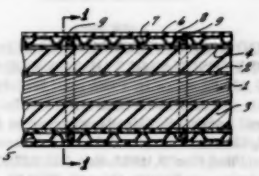
Wolfgang Roenisch, Mellendorf; Joachim Klass, Stadthagen; Hermann-Uwe Voigt, Hanover; Ferdinand Hanisch, Burgwedel; Cornelius van Hove, Langenhagen, and Horst Matzat, Garbsen, all of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 5, 1980, Ser. No. 127,493

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1979, 2908454; Sep. 27, 1979, 2939100; Dec. 4, 1979, 2948651; Dec. 4, 1979, 2948718

Int. Cl.³ H01B *7/28, 13/22*

U.S. Cl. 174—106 D **12 Claims**



1. Power cable, particularly for high voltages and including at least one conductor; an insulation envelope surrounding the conductor; and a conductive layer on the envelope, surrounding the envelope completely in intimate contact therewith, the

improvement of an assembly on the conductive layer comprising:

a corrugated metal tube surrounding the conductive layer corrugations of the tube looping around the circumference of said conductive layer in order to provide radial resiliency for taking up any thermal expansion of the conductor and envelope underneath; and

individual rubber-elastic rings respectively disposed in spaces between the metal tube and the conductive layer and forming annularly completely closed seals along the cable, the rings being resiliently urged against the conductive layer by corrugation of the metal tube.

9. The method of making a cable, comprising providing a core which includes a conductor with an insulating jacket and a conductive layer thereon;

placing individual rings of a rubber-elastic material on the core;

folding a metal strip around the core and closing it to obtain a tube;

corrugating the tube so that the rings lodge in individual grooves which loop around the core; and

urging the grooves radially inwardly to compress the rings while ridges of the corrugation are urged in intimate contact with the conductive layer.

4,458,106

SUPER CONDUCTIVE WIRE

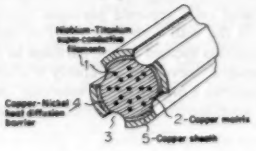
Toshinari Ando; Masataka Nishi; Yoshikazu Takahashi, and Susumu Shimamoto, all of Tokaimura, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Oct. 26, 1982, Ser. No. 436,700

Claims priority, application Japan, Nov. 2, 1981, 56-174432

Int. Cl.³ H01B *12/00*

U.S. Cl. 174—126 S **5 Claims**



1. A super-conductive wire, comprising:

a metal matrix;

a plurality of super-conductive filaments disposed within said metal matrix;

a heat shield layer disposed about said matrix for preventing the diffusion of heat into said matrix from the exterior surface of said super-conductive wire; and

longitudinally extending grooves defined within the surface of said super-conductive wire and having sufficient radial depth so as to penetrate said heat shield layer and extend into said metal matrix for permitting heat from said matrix to be discharged exteriorly of said super-conductive wire.

4,458,107

METHOD AND APPARATUS FOR ELIMINATING PULSATORY DISCHARGES OF THE CORONA EFFECT ALONG AN ELECTRIC POWER LINE WHEN THE CONDUCTORS ARE WET

Paul Heróux, Longueuil, Canada, assignor to Hydro Quebec, Montreal, Canada

Filed Dec. 3, 1981, Ser. No. 327,077

Claims priority, application Canada, Apr. 27, 1981, 376,258

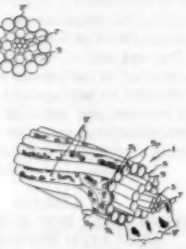
Int. Cl.³ H01B *5/08*; H02G *7/00*

U.S. Cl. 174—127 **6 Claims**

1. A line for use as an aerial, high voltage electric power transmission line, comprising:

a metallic conductor;

a strip of fabric made from a non-conductive, fibrous material having fibers capable of absorbing water by capillary action and retaining said water in the form of very thin filaments or veins of water forming a multitude of small tips all over the surface of the fabric, said strip being attached to the outer surface of the said conductor so that the fibers of the fabric are in close contact with said conductor and exposed to the environment free of any conductive material for shielding the fibers of the fabric so



that the capillary effect of said fibers ensures the formation of a multitude of small water tips exposed to the environment having a very strong ionizing effect all over the surface of the fabric and therefore on the surface of the conductor when said conductor is wet, said multitude of ionizing tips appearing only when it rains, substantially reducing the level of the limit at which the corona effect appears and thus ensuring production of said corona effect in the shape of permanent glow-discharges instead of partial pulsatory discharges.

4,458,108

PIERCING FLUID-TIGHT CONNECTOR

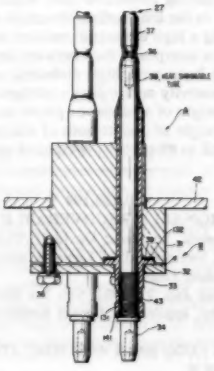
Hiroo Kashimoto; Tadatoshi Kosa; Akihiko Inoue; Shigemitu Yamamoto, and Katuhiko Kuroishi, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd. and Osaka Gas Company Limited, both of Osaka, Japan

Filed Dec. 22, 1980, Ser. No. 218,979

Claims priority, application Japan, Dec. 26, 1979, 54-181787

Int. Cl.³ H01B *17/30*

U.S. Cl. 174—152 R **6 Claims**



1. A piercing fluid-tight connector device for an accumulation tank containing an ultra-low temperature fluid, comprising:

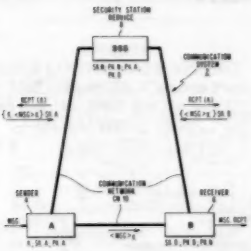
an ultra-low temperature cable for connection to said accumulation tank and having a conductor;
an insulating sleeve having a flange, said insulating sleeve having a female thread at an inner peripheral surface;
an electrically conductive rod having a male thread at an outer peripheral surface, said male thread being threadingly engaged with said female thread to integrally couple said sleeve and said rod;
means connecting said ultra-low temperature cable to said conductive rod;
a sealing member interposed between said male and said female threads to maintain fluid tightness therebetween;
a main metal body, said integrally coupled sleeve and rod extending through said main metal body;
a metal support disposed around said insulating sleeve; and
at least one bolt for securing said metal support to said main metal body, said bolt being tightened to close a gap between the metal body and said metal support to provide a fluid-tight seal between said flange and said main metal body.

4,458,109

METHOD AND APPARATUS PROVIDING REGISTERED MAIL FEATURES IN AN ELECTRONIC COMMUNICATION SYSTEM

Christian Mueller-Schloer, Vorhees, N.J., assignor to Siemens Corporation, Iselin, N.J.

Filed Feb. 5, 1982, Ser. No. 346,227
Int. Cl.³ H04L *9/00*
U.S. Cl. 178—22.11 **16 Claims**



1. A method for providing a security feature in an electronic communication system, wherein said communication system contains a first and a second terminal and a commmunication network, wherein said first terminal is provided for sending a message to said second terminal, wherein said second terminal is provided for receiving said message, and wherein a security service station is provided to communicate with said first and second terminal via said communication network, comprising the steps of:

(a) in said first terminal (A), generating a key (K) at random;

(b) in said first terminal (A), encrypting said message (MSG) with said random key (K), thereby obtaining a first encrypted message:

$$<MSG>_K;$$

(c) in said first terminal (A), deriving a first quantity of data (CS.A=$<MSG>_K$ in FIG. 1) defining said first encrypted message ($<MSG>_K$) and composing from said first quantity of data (CS.A) and from said key (K) a composed data quantity: (K, CS.A)

(d) in said first terminal (A), encrypting said composed data quantity with a first secret key (SK.A) which is specifically assigned to said first terminal (A), thereby obtaining a first encrypted composed quantity of data:

$$\{K,CS.A\}SK.A$$

(e) sending said first encrypted compound quantity of data ({K,CS.A}SK.A) from said first terminal (A) to said security service station (SSS);

(f) sending said first encrypted message ($<MSG>_K$) from said first terminal (A) to said second terminal (B);

(g) in said second terminal (B), deriving a second quantity of data (CS.B=$<MSG>_K$ in FIG. 1) defining said first encrypted message ($<MSG>_K$) received from said first terminal (A) and encrypting said second quantity of data with a second secret key (SK.B) which is specifically assigned to said second terminal (B), thereby obtaining a second encrypted quantity of data:

$$CR.3=\{<MSG>_K\}SK.B;$$

(h) sending said second encrypted quantity of data (CR.3) from said second terminal (B) to said security service station (SSS);

(i) in said security service station (SSS), decrypting said first encrypted composed quantity of data ({K,CS.A}SK.A) received from said first terminal (A) with a first predetermined key (PK.A) which is specifically assigned to said first terminal (A), thereby obtaining said first quantity of data (CS.A) and said random key (K);

(j) in said security service station (SSS), decrypting said second encrypted quantity of data (CR.3) received from said second terminal (B) with a second predetermined key (PK.B) which is specifically assigned to said second terminal (B), thereby obtaining said second quantity of data (CS.B);

(k) in said security service station (SSS), determining if said first quantity of data (CS.A) is equal to said second quantity of data (CS.B);

(l) if so (CS.A =CS.B),in said security service station (SSS), composing a receipt information (RC in FIG. 1) comprising said random key (K) and said first quantity of data (CS.A):

$$RC=K,CS.A;$$

(m) in said security service station (SSS), encrypting said information (RC) with a secret network key (SK.N) specifically assigned to said security service station (SSS),thereby obtaining a receipt (RCPT):

$$RCPT(K)=\{RC\}SK.N;$$

(n) sending said receipt (RCPT) from said security service station (SSS) to said first terminal (A);

(o) sending said receipt (RCPT) and random key information (K) from said security service station (SSS) to said second terminal (B);

(p) in said second terminal (B), extracting said random key (K) from said random key information; and

(q) in said second terminal (B), decrypting said first encrypted message ($<MSG>_K$) with said random key (K), thereby obtaining said message (MSG) in clear text. (FIG. 1).

4,458,110

STORAGE ELEMENT FOR SPEECH SYNTHESIZER

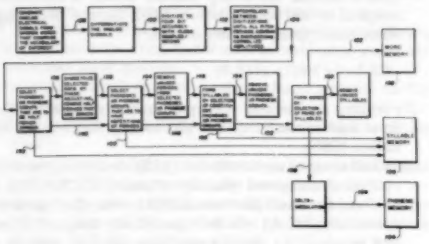
Forrest S. Mozer, 38 Somerset Pl., Berkeley, Calif. 94707

Division of Ser. No. 761,210, Jan. 21, 1977, Pat. No. 4,214,125, which is a continuation of Ser. No. 632,140, Jan. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 525,388, Nov. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 432,859, Jan. 14, 1974, abandoned. This application Oct. 2, 1979, Ser. No. 81,248
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—32 **3 Claims**

1. For use with a synthesizer of original information bearing time domain signals from compressed information time domain

signals produced by predetermined different signal compression techniques, a memory device comprising:

means for storing said compressed time domain signals and instruction signals in the form of X period zeroed representations of said original time domain signals, wherein X is a fraction in the range from about one-fourth to about three-fourths, specifying the particular X period zeroing compression technique applied to said original information bearing time domain signals to produce corresponding portions of said compressed information time domain



signals, said compressed information time domain signals comprising a plurality of samples resulting from said predetermined X period zeroing signal compression technique; and

means for enabling said compressed information time domain signals and said instruction signals to be read out from said memory device to enable said compressed information time domain signals to be expanded using the X period zeroing technique specified by the corresponding instruction signals.

4,458,111

CHARGING AND DISCHARGING CIRCUIT

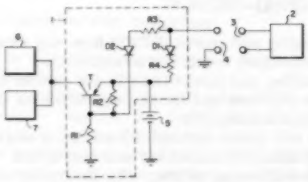
Mayumi Sugihara, Funabashi, Japan, assignor to Tandy Corporation, Fort Worth, Tex.

Filed Jan. 21, 1982, Ser. No. 341,242

Claims priority, application Japan, Jan. 23, 1981, 56-008103[U]

Int. Cl.³ H04M *1/02*

U.S. Cl. 179—2 BC **3 Claims**



1. A charge-discharge switching circuit for use in a cordless telephone including a base unit and a handset, wherein the base unit comprises a charger having an output and a pair of first charging electrodes respectively connected to said output, and wherein the handset is removably mounted to the base unit and has a transmitter/receiver for wireless communicating with the base unit, a rechargeable storage battery, and a pair of second charging electrodes which are brought into contact with the pair of first charging electrodes respectively when the handset is placed on the base unit, characterized in that the charge-discharge switching circuit is provided in the handset, said circuit being operative in response to the output signal of the charger to separate the battery from the transmitter/-receiver for charging the storage battery when the handset is placed on the base unit and to connect the storage battery to the transmitter/receiver for supplying electrical power for the transmitter/receiver when the handset is separated from the base unit.

4,458,112

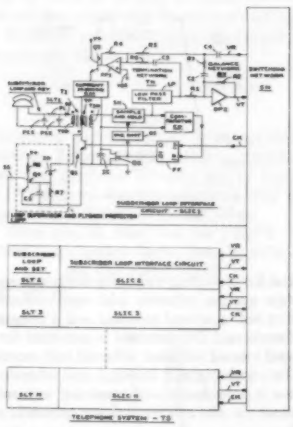
FLOATING SUBSCRIBER LOOP INTERFACE CIRCUIT

Carl G. Svala, Norwalk, Conn., assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 29, 1981, Ser. No. 316,272

Int. Cl.³ H04M *3/22, 19/00*

U.S. Cl. 179—18 FA **19 Claims**

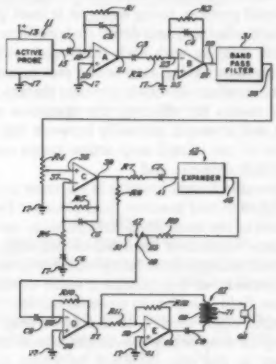


1. A subscriber loop interface circuit for connecting a subscriber loop and set to a switching network comprising: a transformer means having a primary winding and a secondary winding including rectifier and filter means connected to the subscriber loop; sensing means including a sense winding in said transformer means; switching means for feeding current pulses having a given frequency very much greater than the operating frequency of the subscriber loop through said primary winding; control means connected to said sensing means for controlling a characteristic of the current pulses via said switching means in accordance with the voltage across said secondary winding following the termination of a primary current pulse; and low-pass filter means connected to said sensing means for transmitting voice signals, generated by the subscriber set onto the subscriber loop as a superimposed signal on the voltage across said secondary winding, to the switching network.

4,458,113
CONDUCTOR PAIR IDENTIFIER APPARATUS

Jay A. Tolman, Leander, Tex., assignor to A.P.C. Industries, Inc., Austin, Tex.

Filed Apr. 1, 1982, Ser. No. 364,308
Int. Cl.³ H04B 3/46
U.S. Cl. 179—175.3 A 2 Claims

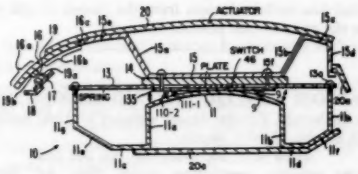


1. A telephone cable conductor pair identifier apparatus comprising a signal sensor device connected via a plurality of amplifier and filter stages to an audio signal emitter, with an "Expander" interposed in series with said amplifier stages.

4,458,114
HAND CONTROLLER SPRING

Gordon H. May, 3365 Sudbury Rd., Cameron Park, Calif. 95682

Filed Aug. 16, 1982, Ser. No. 408,327
Int. Cl.³ H01H 19/00
U.S. Cl. 200—6 A 6 Claims



1. A deflectible spring means for use in allowing a first portion of a hand controller for a video display to be moved relative to a second portion of the hand controller, said spring means for aligning said first portion and said second portion in a nominal position in the absence of a disturbing force while allowing one of said portions to rock in any direction relative to the other portion in response to a disturbing force, said spring means comprising

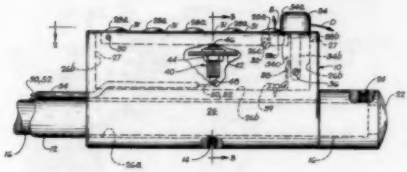
a substantially flat rockable spring center plate adapted to be fixedly attached to one of said portions of said hand controller, said flat center plate having an outer periphery;

at least three C-shaped spring means, each C-shaped spring means having a first end thereof attached to the outer periphery of said flat center plate at a position substantially equally displaced from the positions on said outer periphery at which adjacent ones of said C-shaped spring means are attached, the other end of each C-shaped spring means having a free end being adapted to be permanently attached to the other of said portions of said hand controller to which said flat center plate is not attached, whereby said C-shaped spring means provide a restoring force for restoring said flat center plate to its nominal position in the absence of a disturbing force applied to said flat center plate by relative movement of said first and second hand controller portions.

4,458,115
SAFETY APPARATUS FOR MOTOR VEHICLES

Philip C. Peterson, 665 Grandview La., Lake Forest, Ill. 60045

Filed Apr. 16, 1982, Ser. No. 369,258
Int. Cl.³ H01H 9/06; A63H 5/08
U.S. Cl. 200—61.85 35 Claims



1. Safety apparatus for power driven vehicles having a handlebar control, comprising:

a hand grip mounted on said handlebar having an outer gripping surface with a portion thereof forming a safety control surface;

safety switch means inside said outer gripping surface of said hand grip for shutting down the power unit of said vehicle in response to withdrawal of or reducing the pressure of an operator's hand on said safety control surface portion of said hand grip,

said safety switch means including a safety switch and control means defining said safety control surface portion of said hand grip for controlling the position of said safety switch;

means normally biasing said safety switch toward a first position for shutting down said power unit, said safety switch movable toward a second position for enabling operation of said power unit in response to the presence or pressure of said operator's hand on said safety control surface portion; and

lockout means on said hand grip selectively movable into a lockout position for retaining said safety switch in said second position even though said operator's hand is withdrawn from or hand pressure is reduced on said safety control surface portion of said hand grip, and biased toward a release position and responsive to movement of said control means of switch means between said first and second positions.

4,458,116
THROTTLE OPERATED CONTROLLER ASSEMBLY

Andrew A. Kenny, Roselle, and Kirk B. Peloza, Glen Ellyn, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 18, 1981, Ser. No. 244,944
Int. Cl.³ H01H 3/42
U.S. Cl. 200—61.89 6 Claims

1. A switch assembly comprising:

(a) housing means adapted for attachment to a device having a rotating member, said housing means including a stationary member and a movable member received thereon and rotatable with respect thereto for adjustment, said housing means including guide means thereon;

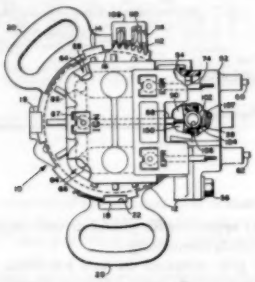
(b) cam means rotatably mounted on said housing means, said cam means including a means defining a first cam surface on the periphery thereof, a second cam surface on the face thereof and including socket means defining

surfaces adapted for engagement of a shaft member for receiving rotary inputs therefrom;

(c) first electrical switch means mounted on said housing means and having actuator means operative to actuate and deactuate said switch means for making and breaking a circuit;

(d) a floating cam follower comprising a member guided by said guide means and slidable therein upon contacting said first cam surface for effecting actuation of said first switch means;

(e) second switch means having actuating means responsive to said second cam surface for making and breaking a circuit;



(f) adjustment means attached to said housing means stationary member, said adjustment means including a worm member rotatable about an axis generally at right angles to the axis of rotation of said movable member, said adjustment means being operative, upon rotation of said worm member, to effect adjustment of the relative rotational position of said movable housing member with respect to said stationary member for adjusting the position of said second switch actuation means with respect to said second cam surface for a given position of said cam means;

(g) means operable to apply a bias to said cam means in one direction rotationally; and,

(h) stop means operable to limit the rotational movement of said cam means in the direction of said bias.

4,458,117

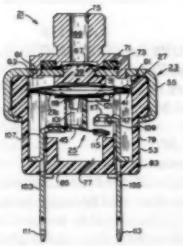
CONTROL DEVICE AND METHODS OF OPERATING SUCH

Ronald L. Johnson, Prophetstown, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Aug. 25, 1982, Ser. No. 411,296

Int. Cl.³ H01H *35/34*

U.S. Cl. 200—83 P **22 Claims**



1. A control device comprising:

a housing having a switch chamber and a pressure fluid chamber therein;

a pair of switch elements disposed in said switch chamber and defining switch means for selective operation between closed and open circuit positions and with at least one of said switch elements being movable between the closed and open circuit positions;

a pair of snap action means disposed in said switch chamber for causing the selective operation of said switch means and including a pair of peripheral portions, and a pair of dome sections integral with said peripheral portions, said peripheral portions being engaged at least generally adjacent each other and said dome sections facing generally in opposite relation with each other and with at least said dome sections having snap acting movement in one direction and another direction opposite thereto, respectively;

abutment means for effecting the operation of said switch means and arranged generally between one of said dome sections of one of said snap action means and said at least one switch element; and

means movable in said housing in response to fluid pressure established in said pressure fluid chamber for transmitting the force of the established fluid pressure onto the other of said dome sections of the other of said snap action means, said transmitting means being movable in response to the fluid pressure of a preselected value established in said pressure fluid chamber to transmit the force thereof onto said other dome section of said other snap action means causing the snap acting movement of said one snap action member in the one direction to effect the movement through said abutment means of said at least one switch element from the open circuit position to the closed circuit position thereof, and said transmitting means being thereafter further movable in response to an increase in the fluid pressure established in said pressure fluid chamber to another preselected value in excess of the first named preselected value to transmit the force thereof onto said other dome section of said other snap action means causing the snap acting movement thereof in the another direction into driving engagement with said one dome section of said one snap action means so as to return it with snap acting movement in the another direction to effect the movement through said abutment means of said at least one switch element from the closed circuit position to the open circuit position thereof.

4,458,118

RESERVOIR WITH LIQUID LEVEL SENSING DEVICE

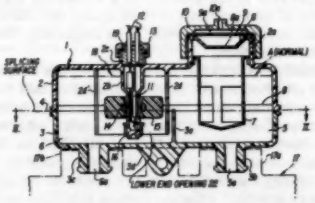
Kaoru Tsubouchi, Toyata, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 24, 1982, Ser. No. 361,350

Claims priority, application Japan, Mar. 24, 1981, 56-42135[U]

Int. Cl.³ H01H *35/18*

U.S. Cl. 200—84 C **5 Claims**



1. A reservoir having a tank made of synthetic resin and a liquid level sensing device wherein said tank comprises upper and lower shells, said upper shell being formed integrally with a depending hollow tubular portion and one of said shells being formed integrally with a heat shielding skirt portion surrounding said tubular portion, said heat shielding skirt portion being

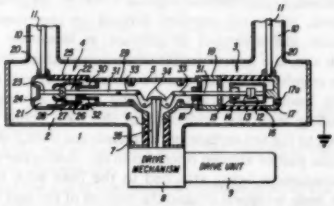
extended into an interior of said lower shell for shielding said tubular portion against the heat applied in the heat welding of the connection of said upper and lower shells, and wherein said sensing device comprises a magnetically actuable switch means enclosed in said depending hollow tubular portion of said tank and a float member having a magnet axially slidable on said tubular portion for actuating said switch means when said magnet is in proximity to said switch means.

4,458,119

HYBRID CIRCUIT BREAKER

Tadashi Hashimoto, Higashimine, and Ken Morita, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 30, 1982, Ser. No. 430,378
Claims priority, application Japan, May 27, 1982, 57-88797
Int. Cl.³ H01H *33/04*
U.S. Cl. 200—145 **4 Claims**



1. A hybrid circuit breaker device for breaking high voltage DC current comprising:

vacuum circuit breaking means for electrical connection to said high voltage DC current having;

an outer decomposition proof sealed gas container;

a vacuum container contained within said decomposition proof gas container,

a fixed contact means contained within said vacuum container,

a movable contact means contained within said vacuum container adapted so that said movable contact means and said fixed contact means can be brought into and separated from said fixed contact means, for interrupting said DC current;

gas circuit breaking means electrically connected in series with said vacuum circuit breaking means having a fixed contact means and a movable contact means adapted so that said movable contact means and said fixed contact means can be brought into and separated from said fixed contact means, for interrupting and isolating said DC current;

drive unit means that brings into and separates the respective movable and fixed contact means of said vacuum circuit breaking means and said gas circuit breaking means;

a sealed grounded tank containing insulating gas, said vacuum circuit breaking means and said gas circuit breaking means; and

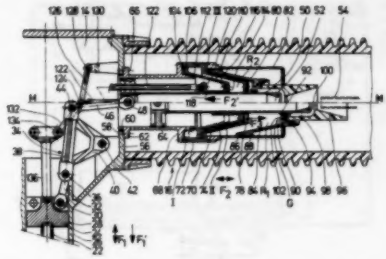
supporting means supporting said vacuum circuit breaking means and said gas circuit breaking means within said sealed grounded tank.

4,458,120

HIGH-VOLTAGE CIRCUIT BREAKER

Gerhard Körner, Schriesheim, and Horst Plettner, Hanau, both of Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 13, 1982, Ser. No. 397,774
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1981, 3127678
Int. Cl.³ H01H *33/82*
U.S. Cl. 200—148 A **7 Claims**



1. A high-voltage circuit breaker, comprising:

a fixed contact;

a movable contact including a drive system for moving it relative to said fixed contact;

a piston/cylinder system for compressing a quenching gas during movement of said movable contact, said system including a cylinder with a stationary wall towards which a main piston moves to compress the quenching gas;

an auxiliary piston disposed on the side of said stationary wall that is opposite the side facing said main piston;

means responsive to actuation of said drive system for moving said auxiliary piston towards said stationary wall in opposition to the direction of movement of said main piston during the first half of a circuit breaking operation by the circuit breaker, and for moving said auxiliary piston in the same direction as said main piston during the second half of the circuit breaking operation; and

means for admitting gas compressed in the space between said auxiliary piston and said stationary wall during said first-half movement into the space between said main piston and said stationary wall.

4,458,121

DC CIRCUIT BREAKER

Satoru Yanabu, Machida; Toboru Tamagawa, Chigasaki; Eiji Kaneko, and Takumi Funahashi, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 30, 1982, Ser. No. 428,949
Claims priority, application Japan, Apr. 19, 1982, 57-65094
Int. Cl.³ H01H *33/70, 33/59*
U.S. Cl. 200—148 R **9 Claims**

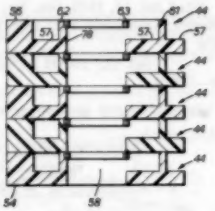
1. A DC circuit breaker comprising:

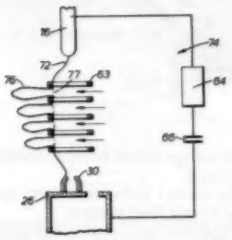
a fixed electrode and movable electrode that can be moved towards each other or separated from each other;

means for discharging arc-extinguishing gas when the said two electrodes are separated from each other; and

means for extinguishing the arc which receives the said arc-extinguishing gas and blows it onto the arc which is formed between the two electrodes, wherein said arc-extinguishing means comprises an oscillation circuit that is connected in parallel with the two electrodes; an arc-extinguishing block which is provided with a through-hole for the fixed electrode arranged between the said two electrodes, through which the fixed electrode can pass to approach or move away from the movable electrode; a blast flow path to guide the arc-extinguishing gas to blow

onto the said arc; a plurality of arc extension flow paths opening onto the said through-hole for the fixed electrode whereby the arc-extinguishing gas is exhausted; and





wherein at least one auxiliary electrode is mounted in the regions where the said arc extension flow paths respectively open into the through-hole for the fixed electrode.

4,458,122

CAM SWITCH MECHANISM AND CONTROL DEVICE, SUCH AS A PULLKEY, INCORPORATING THE SAME

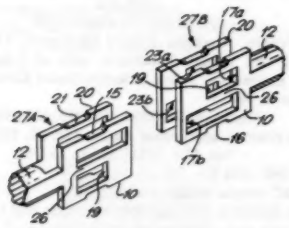
Peter D. Knight, Nottingham, England, assignor to Communication and Control Engineering Company Limited, Nottingham, England

Filed Feb. 18, 1983, Ser. No. 467,980

Claims priority, application United Kingdom, Feb. 19, 1982, 8204989

Int. Cl.³ H01H 17/06

U.S. Cl. 200—153 LA **21 Claims**



14. A pullkey comprising a housing, entry means at opposite ends of the housing to receive ends of pullwires or pullrods, and a switch mechanism mounted within said housing, said switch mechanism comprising first switch means arranged to initiate a first output response, a second switch means arranged to initiate a second output response, first and second cam members mounted for linear relative sliding movement, each cam member defining a first cam surface which controls actuation of said first switch means and a second cam surface which controls actuation of said second switch means, and a manually controllable actuator capable of actuating said first switch means independently of the movement of said cam members without inhibiting subsequent relative sliding movement of the cam members, wherein said first output response is lockout, said second output response is a signal, and said manually controllable actuator comprises a lockout knob.

4,458,123

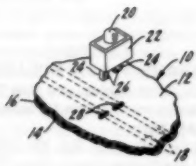
CONNECTOR FOR ATTACHING AN ELECTRICAL COMPONENT TO A MEMBRANE KEYBOARD

Harold F. Hengesh, Waukegan; Michael J. Marcier, Cherry Valley, and Anthony J. Van Zeeland, Crystal Lake, all of Ill., assignors to Oak Industries, Inc., Rancho Bernardo, Calif.

Filed Sep. 3, 1982, Ser. No. 414,628

Int. Cl.³ H01H 9/00

U.S. Cl. 200—159 B **5 Claims**



1. In a membrane switch panel of the type having a flexible membrane, a substrate and a spacer between the membrane and substrate, electrical circuitry formed on the membrane and substrate and arranged to provide at least one membrane switch site, the improvement comprising means for attaching to the membrane switch panel a discrete electrical component having leads, said means including a base having a pair of depending legs, the underside of the base being adhesively secured to the top surface of the membrane switch panel and at least one pair of aligned openings in the membrane and spacer, the component being attached to the base with the component's leads wrapped around the bottom of the legs of the base, the legs and leads extending through said openings such that the leads contact the circuitry on the surface of the substrate, the component's leads being held in contact with the electrical circuitry by being trapped between the base and the substrate.

4,458,124

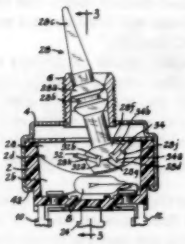
MULTICOLOR ILLUMINATED TOGGLE SWITCH

Neil W. Kroth, Cary, and Gursharan P. S. Nat, Smithfield, both of N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 20, 1982, Ser. No. 410,105

Int. Cl.³ H01H 9/16

U.S. Cl. 200—311 **21 Claims**



1. An illuminated toggle switch comprising, in combination:

a housing;

switch contacts in said housing;

a light source mounted in said housing;

a light transmissive toggle lever pivotally mounted in said housing for reciprocal movement, said lever comprising

an operating handle at its exterior end and having operative connection with said switch contacts at its interior end, said interior end of said lever further comprising a portion overlying said light source;

light transmissive colored filter means attached to said overlying portion wherein said reciprocal movement of said toggle lever actuates said switch contacts and carries said filter means into and out of position over said light source for transmitting colored or uncolored light, respectively, through said lever to said handle; and

complementally shaped attachment means on said overlying portion and said filter means for structurally attaching said filter means to said overlying portion, said attachment means comprising a dovetail slot and a dovetail rib, said filter means being slideably attached to said overlying portion from a lateral edge of said overlying portion.

4,458,125

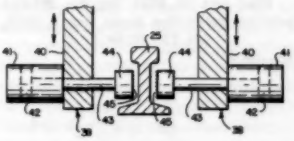
REPAIR METHOD AND APPARATUS

Brian N. Leis, Columbus, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Continuation-in-part of Ser. No. 291,195, Aug. 10, 1981, abandoned. This application Nov. 8, 1982, Ser. No. 439,682

Int. Cl.³ H05B *6/38*

U.S. Cl. 219—10.41 **12 Claims**



1. A method of repairing a crack in the material of a steel rail in situ comprising:

a. heating the rail at the crack and in the vicinity of the crack to a first temperature,

b. gripping the rail at positions on opposite sides of the crack with unyielding means to hold the rail with a substantially fixed distance between the gripping positions on the rail,

c. heating the rail to a second temperature to create a compressive force and pressure at the crack sufficient to diffusion bond the opposite sides of the crack at the second temperature, under the force of thermal expansion of the rail, the second temperature being higher than the diffusion bonding temperature of the steel material at the pressure in the crack, in the absence of adding substantially any material, and

d. cooling the rail and releasing the rail.

4,458,126

MICROWAVE OVEN WITH DUAL FEED EXCITATION SYSTEM

Raymond L. Dills, Louisville, Ky.; Royce W. Hunt, Jeffersonville, Ind., and Louis H. Fitzmayer, Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 30, 1982, Ser. No. 363,705

Int. Cl.³ H05B *6/72*

U.S. Cl. 219—10.55 F **12 Claims**

1. A microwave cooking appliance comprising:

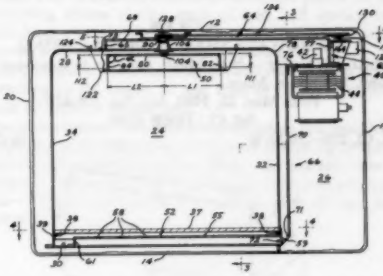
a cooking cavity for receiving objects to be heated, including a top wall, a bottom wall, a back wall, a pair of opposing side walls and a front wall defined by a front opening access door;

a support shelf disposed within said cavity for supporting objects to be heated therein, the plane of said shelf defining a cooking plane for said cavity;

a source of microwave energy;

dynamic microwave radiating means supported adjacent said top wall and extending within said cavity for radiating microwave energy into said cavity, said dynamic radiating means having a time-varying impedance and a time-averaged radiating pattern characterized at the cooking plane by regions of relatively high energy density and regions of relatively low energy density;

static microwave radiating means supported adjacent said bottom wall for radiating microwave energy into said cavity, said static radiating means supplying a substantially stationary radiating pattern characterized by regions of relatively high energy density and regions of relatively



low energy density at the cooking plane, which regions overlay at least some of said regions of low and high energy density, respectively, of said time-averaged antenna pattern, thereby enhancing the time-averaged energy distribution at the cooking plane; and

means for fractionally apportioning the energy from said source between said dynamic field radiating means and said static field radiating means as a function of the relative impedance of each.

4,458,127

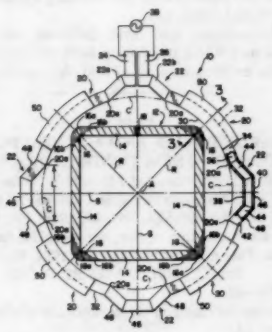
INDUCTOR FOR ANNEALING WORK HARDENED PORTIONS OF STRUCTURAL BEAMS

James J. Pusateri, Cleveland; Charles R. Bartlett, Newbury, and Paul D. Brazie, West Richfield, all of Ohio, assignors to Park-Ohio Industries, Inc., Cleveland, Ohio

Division of Ser. No. 266,882, May 26, 1981, Pat. No. 4,401,486. This application Feb. 17, 1983, Ser. No. 467,242

Int. Cl.³ H05B *6/04*

U.S. Cl. 219—10.79 **9 Claims**



1. A single turn encircling inductor for inductively heating and annealing work hardened corners of an elongate hollow structural beam cold formed to provide opposed pairs of planar walls with said work hardened corners between adjacent ones of said walls, said beam having an axis, said inductor extending circumferentially about said axis and having circumferentially spaced apart first inductor portions each corre-

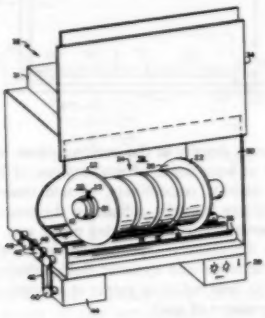
sponding to a different one of said corners of said beam, each said first portion being radially spaced from said axis a given distance, second inductor portions extending circumferentially between and interconnecting adjacent ones of said first portions, each said second portion overlying a portion of the planar wall of said beam between the corners corresponding to said adjacent ones of said first portions, and each said second portion being offset radially outwardly with respect to said adjacent ones of said first portions.

4,458,128

MICROWAVE SHEET RUBBER CURING

Irving J. Chabinsky, Acton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Mar. 28, 1983, Ser. No. 479,422
Int. Cl.³ H05B 5/00
U.S. Cl. 219—10.55 R **15 Claims**



1. Apparatus for curing calendered rubber with microwave energy, comprising:

a microwave oven;

a pair of apertured conductive disks parallelly spaced in said microwave oven;

a conductive cylinder inserted through said apertures of said disks;

a roll of said sheet rubber wrapped around said conductive cylinder between said disks, said roll having a microwave transparent liner separating adjacent layers of said sheet rubber, the ends of said roll abutting against the adjacent faces of said disks; and

means for rotating said disks, cylinder, and roll about a mutual axis while irradiating with microwave energy to provide uniform heating of said sheet rubber.

4,458,129

DISCHARGE DEVICE AND METHOD FOR USE IN PROCESSING SEMICONDUCTOR DEVICES

John J. Zasio, Sunnyvale, and Michael W. Samuels, San Jose, both of Calif., assignors to Fujitsu, Limited, Kawasaki, Japan

Division of Ser. No. 098,523, Nov. 29, 1979, Pat. No. 4,350,866, which is a continuation of Ser. No. 840,674, Oct. 11, 1977, abandoned. This application Mar. 11, 1982, Ser. No. 356,951
Int. Cl.³ B01J 17/00; B23P 1/00
U.S. Cl. 219—68 **9 Claims**

1. A process for electron beam exposure of a wafer comprising the steps of,

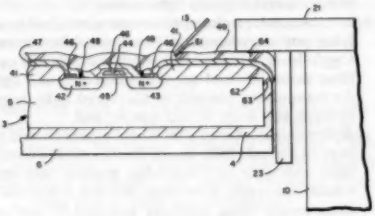
covering a conductive region of a wafer with an insulating layer,

forming an electron beam resist layer on said insulating layer to form a resist-coated wafer,

mounting said resist-coated wafer in an electrically conducting wafer holder,

applying a voltage between a surface of said insulated wafer and said wafer holder to cause an electrical connection between said conductive region and said wafer holder,

engaging said wafer holder and the electrically connected wafer in an electron beam apparatus, and



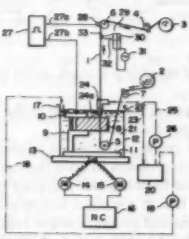
exposing said resist layer to an electron beam in the electron beam apparatus whereby a current caused by said electron beam is conducted through said electrical connection.

4,458,130

IMMERSION-TYPE TRAVELING-WIRE ELECTROEROSION MACHINING METHOD

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Aug. 24, 1981, Ser. No. 295,502
Claims priority, application Japan, Sep. 4, 1980, 55-123195
Int. Cl.³ B23P 1/08
U.S. Cl. 212—69 W **10 Claims**



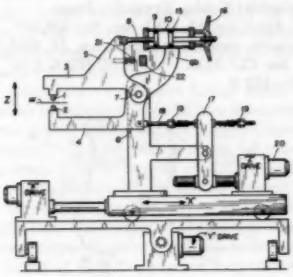
1. In a method of electroerosively wire-cutting an electrically conductive workpiece wherein a continuous electrode wire traversing the workpiece and stretched under tension thereacross is axially transported at a preselected rate of axial travel to continuously renew an electrode surface juxtaposed and defining a traveling-wire cutting gap therewith in the presence of a machining medium and the cutting gap is electrically energized to electroerosively remove material from the workpiece against the renewing electrode surface while the workpiece is displaced relative to the traveling electrode wire transversely along a desired path of cutting, the improvement which comprises the steps of:

(a) immersing said workpiece in a continuous, substantially static mass of a liquid medium retained in a worktank so that the region of said traveling-wire cutting gap is located substantially below the surface of said mass and is thereby directly enclosed with said liquid medium and thereby subjected to a hydrostatic pressure exerted by said mass;

(b) disposing at least one nozzle means adjacent to said workpiece so as to have a nozzle opening directly immersed in said mass and trained towards and spaced from said region directly across said liquid medium; and

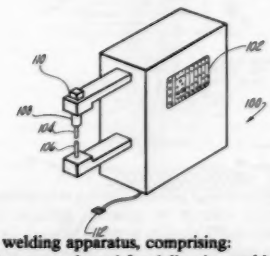
(c) supplying said nozzle means with a liquid machining medium so as to project a high-velocity stream thereof from said nozzle opening through the first-mentioned liquid medium into said region directly immersed in said substantially static mass.

4,458,131
ROBOT WELDER
Richard Challenger, Cortland, Ohio, assignor to The Taylor-Winfield Corporation, Warren, Ohio
Filed Jun. 21, 1982, Ser. No. 390,240
Int. Cl.³ B23K *11/30*
U.S. Cl. 219—89 2 Claims



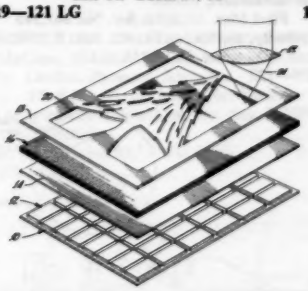
1. A resistance welding machine comprising a pair of confronting welding electrodes for welding a work therebetween, a pair of elongated pivotally mounted horns for supporting large panels therebetween, each supporting one of said electrodes, an air operating cylinder enclosing a pair of pistons, one of said pistons pivotally connected to one of said horns, the other of said pistons having means for adjusting its longitudinal position in said cylinder, said cylinder being connected to the other of said horns, a fixed stop means for adjustably limiting pivotal movement of said one of said horns, stepping motor means for selectively driving, in opposite directions, said other of said horns, and means for selectively adjusting the position of said electrodes in a vertical and horizontal plane comprising motor driven carriages in stacked relationship, whereby adjustment in three planes at right angles to each other is provided, said electrodes and horns being located directly above said carriages.

4,458,132
WELDING APPARATUS AND CONTROL SYSTEM THEREFOR
Roger G. Reynolds, Pontiac, Mich., and Thomas S. Holtaway, Glen Ellyn, Ill., assignors to Weldex, Inc., Warren, Mich.
Filed Nov. 10, 1980, Ser. No. 205,221
Int. Cl.³ B23K *11/24*
U.S. Cl. 219—114 12 Claims



1. Pulse welding apparatus, comprising:
electrode means adapted for delivering weld current pulses to a workpiece to be welded;
a source of alternating electrical power;
a capacitor means:
a transformer having a primary side connected in series with said capacitor means and said power source, and having a secondary connected with said electrodes means;
means for switching said power source into circuit with said capacitor means whereby to charge the latter with electrical current from said power source and causing said capacitor means to discharge a pulse of electrical current into said primary of said transformer during each half cycle of alternating electrical power;
a firing circuit for controlling the operation of said switching means and delivering a train of electrical pulses to said switching means during each of said half cycles, said switching means switching said power source into said circuit in response to said train of pulses;
memory means for storing programmed data therein corresponding to the timing of said train of pulses relative to each of said half cycles; and
a processor coupled with said memory means and said firing circuit for controlling the operation of said firing circuit in accordance with programmed data, whereby said train of pulses is delivered to said switching means in predetermined timed relationship relative to each of said half cycles.

4,458,133
METHOD AND APPARATUS FOR LASER ENGRAVING OF SMOKE-SENSITIVE MATERIALS
John A. Macken, P.O. Box 696, Santa Rosa, Calif. 95402
Filed Apr. 26, 1982, Ser. No. 371,536
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LG 15 Claims



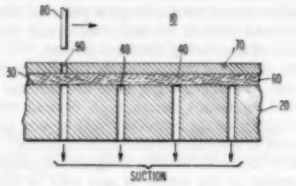
1. In an apparatus for laser cutting of a stack of relatively thin sheets of material in aligned stacked relation, the combination comprising:
means for supporting the stack of sheets;
means for providing a magnetic field; and
template means formed of a magnetic material for placing on top of said stack, the magnetic forces of said magnetic field acting on said template means thereby urging adjacent sheets of material into intimate engagement with sufficient pressure for substantially eliminating penetration of laser beam generated vapors into spaces between said sheets of material.

4,458,134
METHOD AND APPARATUS FOR DRILLING HOLES WITH A LASER
James A. Ogle, Neshanic Station, N.J., assignor to Burroughs Corporation, Detroit, Mich.
Filed Jun. 30, 1982, Ser. No. 393,694
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LK 9 Claims

1. Apparatus for drilling holes with a laser in a metal plate comprising
a support apparatus having a support surface for supporting a metal plate in which holes are to be drilled with a laser,

an insulating sheet on said support surface of said support apparatus,

a metal plate, to be drilled, loosely seated on said insulating sheet, and



a laser disposed above said support apparatus and positioned to form holes in said metal plate seated on said insulating sheet, said insulating sheet serving to prevent molten metal from depositing on said metal plate at the hole formed therein.

4,458,135

COMPACT TOOL FOR AUTOMATIC MAG SPOT WELDING

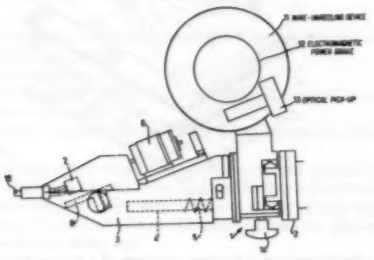
Michel Guichard, Viroflay, and Alain Jouaire, Douai, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Mar. 24, 1982, Ser. No. 361,243

Claims priority, application France, Apr. 8, 1981, 81 07080

Int. Cl.³ B23K *9/12*

U.S. Cl. 219—127 **3 Claims**



1. A mobile spot welding assembly for spot welding with filler metal, comprising:

a welding torch defining a welding zone in which an arc is formed

two props, one of said props being connected to said torch on either side of said welding zone, said props being adapted to press together articles being welded and to provide a negative electric current contact;

a filler welding wire unreeling device including a brake;

a filler welding wire drive device for feeding a wire from said unreeling device to said torch, wherein said wire unreeling device, said brake and said wire drive device are mounted for movement together with said torch and are positioned immediately adjacent said welding zone,

wherein said mobile assembly includc · a base adapted to be fastened to the tip end of an arm of a robot or automatic machine, and a welding head axially slidably mounted on said base without rotation in relation to said base, wherein a prestressed spring or spring assembly is provided between said base and said head to limit the alignment force produced at the level of the props, and wherein said torch is secured to said head and said welding assembly can be fastened to the arm by means of quick action couplings that make presetting and a quick jointing with strict positioning possible with only a minimum amount of tooling required for mounting and unmounting.

4,458,136

METHOD AND APPARATUS FOR MANUFACTURING A LAMP

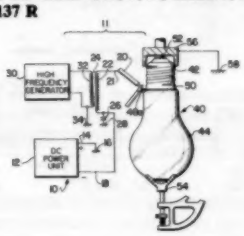
Yuji Wagatsuma, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 12, 1982, Ser. No. 339,049

Claims priority, application Japan, Jan. 23, 1981, 56-7879

Int. Cl.³ B23K *9/00, 9/06;* H01K *3/02*

U.S. Cl. 219—137 R **13 Claims**



1. A method for manufacturing a lamp, comprising the steps of:

preparing a lamp assembly so as to have a bulb coupled to a base and having external lead-in wires, the base having an edge which mates with said bulb, one of the lead-in wires having an outer end which is drawn out between the bulb and the edge of the base;

applying a potential between a welding electrode of a welding device and a tip of said outer end of the external lead-in wire; and

during said potential applying step, interposing a gas flame between the outer end of the external lead-in wire and said welding electrode.

4,458,137

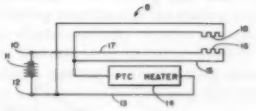
ELECTRIC HEATER ARRANGEMENT FOR FLUID FLOW STREAM SENSORS

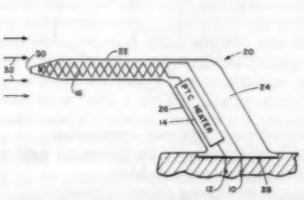
William R. Kirkpatrick, Faribault, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Apr. 9, 1981, Ser. No. 252,289

Int. Cl.³ H05B *3/02;* G01F *1/46;* G01P *5/16;* H01C *7/02*

U.S. Cl. 219—201 **10 Claims**





1. An improved heater for use in a fluid flow stream data

sensor, the sensor comprising a probe and support means each having an external surface disposed in a flow stream, the flow stream causing varying rates of thermal conduction from such surfaces, the probe having a sensing means supported therein for sensing at least one desired parameter and the support means being coupled to the probe for positioning the probe as desired relative to the flow stream, wherein the improved heater comprises:

first heater means disposed in the probe for providing a portion of the heating thereof, which heater means has substantially constant resistance across the normal operating range of temperatures,

positive temperature coefficient heater means disposed in the sensor in a thermally conductive relationship with the external surface thereof and electrically coupled in a series relationship to the first heater means for providing a further portion of the heat to the sensor, the positive temperature coefficient heater means being formed from a positive temperature coefficient resistor which changes abruptly from a minimum to a maximum resistance about a known temperature for providing analog control of the heat output of both the positive temperature coefficient heater means and the first heater means by operating between such minimum and maximum resistance responsive to the varying rates of thermal conduction from the external surface of the sensor, and

second heater means having substantially constant resistance across the normal operating range of temperatures is disposed in the probe to provide further heating to the probe when the second heater means is electrically coupled to a power supply.

4,458,138

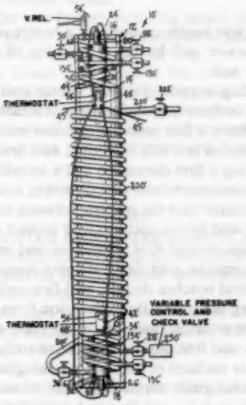
FAST RECOVERY ELECTRIC FLUID

Glenn J. Adrian; Harry W. Adrian, and James W. Penner, all of Butterfield, Minn. 56120

Filed Dec. 15, 1980, Ser. No. 216,330

Int. Cl.³ F24H *1/20*; F28D *1/06*; H05B *3/82*

U.S. Cl. 219—304 **11 Claims**



1. A fast recovery water heating system comprising a closed elongated housing defining an interior space, said interior space being capable of being entirely filled with water and said housing being capable of withstanding high internal pressure, said housing including:

first and second ends, first and second elongated electrical heating elements extending into said interior space through said first and second ends respectively, said elements being coaxially aligned with said housing,

admitting means in said housing located toward one of said ends for injecting water into said space,

withdrawing means in said housing located toward the other of said ends distant from said admitting means for permitting withdrawal of water from said space,

a first helical tubular member disposed coaxially around said elements and generally extending from said first to said second end, inlet and outlet means connected to ends of said helical member for permitting and controlling the passage of water through said member,

an open-ended elongated tubular member disposed coaxially with respect to said heating elements and within said helical tubular member, said elongated tubular member including a plurality of apertures therein located generally midway along the length thereof to allow the water filling the interior of the elongated tubular member and highly heated by said heating elements to flow out of the elongated tubular member into contact with the helical tubular member,

first and second thermostatic means affixed to said housing proximate said first and second elements respectively for controlling the flow of electricity to said heating elements to maintain a relatively constant predetermined temperature within said interior space,

the volume of said interior space and the heat output of said heating elements being selected so that a nearly instantaneous increase in water temperature is achieved when said heating elements are energized.

4,458,139

ELECTRICALLY HEATED COOKING UTENSIL

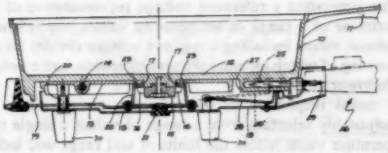
John W. McClean, Sydney, Australia, assignor to Breville Holdings Pty., Limited, Pyrmont, Australia

Filed Jul. 21, 1982, Ser. No. 400,399

Claims priority, application Australia, Aug. 5, 1981, PF0062; Jun. 24, 1982, PF4575

Int. Cl.³ F27D *11/02*

U.S. Cl. 219—433 **10 Claims**



1. In an electrically heated cooking utensil of the type including a base having a heat-conductive heating plate for supporting a vessel including at least a heat-conductive bottom and an electrical heating element and electrical connector means thereof. The electrical heating element being carried by and heating the heating plate which in turn heats the bottom surface of the vessel, the improvement comprising means for removably and interlockingly engaging the vessel and the base including:

a vessel having a central boss on the bottom undersurface thereof, said central boss having interengaging boss elements disposed on the surface thereof;

a heating plate having a central aperture therein for receiving the central boss therethrough when the vessel is supported on the heating plate;

vessel engaging means rotatably connected to the base for rotation about a vertical axis thereof, comprising a rotatable central sleeve coaxial with the central boss, and interengaging sleeve elements disposed on the inner surface of the central sleeve for interengagement with the interengaging boss elements upon rotation of the sleeve; and

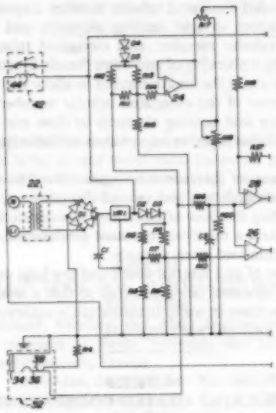
lever means operatively connected to the central sleeve for rotating the central sleeve to lockingly engage and disengage the interengaging boss and sleeve elements.

4,458,140

TEMPERATURE CONTROL APPARATUS FOR CONVECTION OVEN

Irving R. Belinkoff, Bellerose Manor, N.Y., assignor to Kidde Consumer Durables Corp., Bala Cynwyd, Pa.

Continuation of Ser. No. 196,514, Oct. 14, 1980, abandoned.
This application Apr. 19, 1982, Ser. No. 369,969
Int. Cl.³ H05B 1/02
U.S. Cl. 219—497 11 Claims



1. An oven for preparing food by circulating heated air, said oven including apparatus for controlling the internal temperature of the food being prepared to a desired temperature by switching the air heating element on or off, comprising:

(a) means for sensing the internal temperature of the food,

(b) reference circuit means responsive to the sensing means for generating a reference voltage representative of one extreme of a range of temperature values, the reference circuit means including a resistive voltage divider circuit, one leg of which includes the sensing means, and a voltage follower circuit,

(c) means responsive to the reference circuit means for adjustably selecting from a range of values a single temperature value within the limits of said range and indicative of a desired internal food temperature,

(d) first analog circuit means for comparing the sensed internal food temperature to the selected temperature and generating an analog signal proportional to the difference between the sensed and selected temperatures,

(e) second circuit means for comparing the sensed internal food temperature to a fixed reference and generating a signal indicative of proper operation of the temperature sensing means,

(f) third circuit means for generating a switch control signal in response to the signals generated by the first and second circuit means,

(g) switch means responsive to the switch control signal for switching the air heating element on or off, whereby the heating element will be switched on until the temperature difference signal attains a predetermined value indicative of the internal temperature being equal to the selected temperature or until the temperature sensing means malfunctions, and

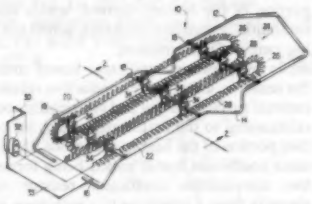
(h) circuit means for maintaining the air heating element in the on state when the probe is detached from the oven, and thermostat means for sensing the temperature of said heated air and switching said air heating element off when said heated air attains a predetermined temperature.

4,458,141

ELECTRIC HEATER AND COIL SUPPORT INSULATOR THEREFOR

H. Keith Howard, and Jimmy L. Sherrill, both of Cookeville, Tenn., assignors to Tutco, Inc., Cookeville, Tenn.

Filed Nov. 14, 1980, Ser. No. 206,899
Int. Cl.³ H05B 3/06
U.S. Cl. 219—532 12 Claims



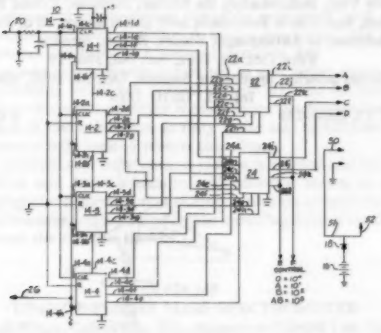
1. An electric heater comprising a heater coil attached to a base, said heater coil having a plurality of convolutions of heater wire, and

an insulating support for said heater coil having a body portion cooperating with means for attaching said support to said base, a first retaining member extending from said body portion in a first direction, said first retaining member having a first dimension and a second dimension, in a plane transverse to said first direction, said first dimension being greater than the spacing between adjacent convolutions of said heater coil and said second dimension being transverse to said first dimension and smaller than said first dimension, said first retaining member having first and second notches therein, said first and second notches extending along said first dimension from an inner part of said first retaining member in opposed directions transverse to said first direction and outwardly toward respective outer surfaces of said first retaining member, and first and second guide surfaces oblique to said first direction adjacent each of said first and second notches, said first guide surface connecting an upper portion of a respective one of said first and second notches to said outer surface and said second guide surface connecting a lower portion of a respective one of said first and second notches to said outer surface, said guide surfaces cooperating to secure a single convolution of said heater coil in each of said first and second notches when said coil is at operating and non-operating temperatures and to allow easy insertion of a convolution into each of said first and second notches.

4,458,142
PROGRAMMED ELECTRONIC KEYCORDER UNIT

Marvin Bernstein, Asbury Park, N.J., assignor to Hecon Corporation, Tinton Falls, N.J.

Filed Apr. 23, 1982, Ser. No. 371,140
Claims priority, application United Kingdom, Oct. 7, 1981, 8130276
Int. Cl.³ B41F 33/02
U.S. Cl. 235—381 26 Claims



1. Control means for preventing unauthorized use of a device and for controlling the extent of such authorized use comprising:

means operative between a first state for providing a device disabling condition and a second state for providing a device enabling condition;

a thin, pocket-sized card unit having a miniaturized solid state counter;

said control means including a card reader unit having means for receiving said card unit;

electronic display means having a plurality of display portions for displaying a count in a decimal format;

card unit coupling means for coupling the count in said card unit to said display means;

said card reader unit further including means for monitoring said device to alter the count contained in said card unit as a function of the usage of said device;

logical gating means responsive to the count displayed by said display means for operating the control means to its first state when the count displayed is other than a predetermined count and for operating said control device to its second state when the count displayed is said predetermined count.

4,458,143
APPARATUS FOR DETERMINING THE AUTHENTICITY OF CURRENCY

Meir Gitlis, Givatayim, Israel, assignor to Nachshol Electronics Ltd., Moshav Bnei Atarot, Israel

Filed Apr. 22, 1982, Ser. No. 370,624
Claims priority, application Israel, Jun. 22, 1981, 63137
Int. Cl.³ G11B 25/01
U.S. Cl. 235—449 5 Claims

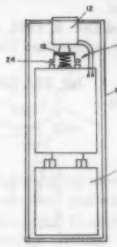
1. Self-contained apparatus for determining the authenticity of banknotes comprising:

a housing configured for being held in a single hand;

a magnetic ink sensing head retractably spring mounted in said housing and providing an electrical output indicating the presence of magnetic material in the vicinity thereof during operation thereof; and

sensible output indication providing means operative to provide a sensible indication of magnetic ink presence on a banknote in response to the electrical output of said sensing head; and

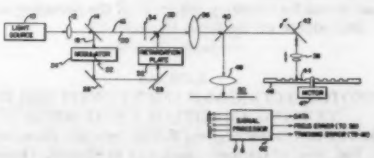
said housing being configured to define a money engagement surface lying coplanar with said magnetic ink sensing head when said sensing head is retracted during operation thereof thereby to define a desired orientation of said magnetic ink sensing had during operation thereof.



4,458,144
APPARATUS FOR READING INFORMATION STORED IN A TRACK PATTERN ON A RADIATION REFLECTING RECORD

Charles Reilly; Leonard Laub, both of Pasadena, and Dennis Rose, Claremont, all of Calif., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Jun. 30, 1981, Ser. No. 279,100
Int. Cl.³ G01J 1/36
U.S. Cl. 250—204 11 Claims



1. Apparatus for reading information stored in a track pattern on a radiation reflecting record comprising:

a source of radiation for supplying at least a reading beam;

objective lens means for passing said reading beam to said record and for controllably focusing said reading beam at a plane of focus;

a photodetector array disposed in an optical path with said lens means for sensing at least said recorded information and focusing errors;

an optical element disposed in said optical path for producing an astigmatic image of said reading beam; and

diffraction means for separating said reading beam into at least zero-order and first-order components;

said photodetector array comprising:

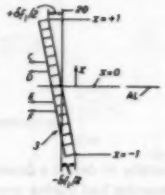
a unitary data photodetector disposed for impingement thereon of said zero-order reading beam component for sensing said recorded information; and

a quadrant photodetector array adjacent to said unitary data photodetector and including separated sectors disposed along orthogonal axes for sensing relative differences of said astigmatic image of said first-order component of said beams along said orthogonal axes to provide at least focus error correction signals to said objective lens means.

4,458,145
AUTOMATICALLY FOCUSSED OPTICAL SYSTEM

Roger Voles, London, England, assignor to EMI Limited, Hayes, England

Filed Dec. 8, 1981, Ser. No. 328,540
Claims priority, application United Kingdom, Dec. 10, 1980, 8039145
Int. Cl.³ G03B 3/10
U.S. Cl. 250—204 6 Claims



1. An automatically focussed optical system comprising means for focussing an image of a scene onto an image plane,

a single array only of detectors lying in a common plane, some of the detectors being capable of generating respective electrical output signals representing the intensity of radiation at portions of the image having a predetermined optical spacing in front of the image plane, and others of the detectors being capable of generating respective electrical output signals reresenting the intensity of radiation at different portions of the image having a predetermined optical spacing behind the image plane,

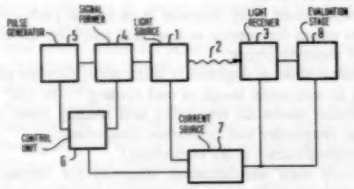
and a processing circuit responsive to said electrical signals to generate a focus signal representing an error in the focus of the focussing means, the focus signal having a value which is related both to differences of intensity of adjacent said portions of the image having said predetermined optical spacing in front of the image plane and to differences of intensity of adjacent said portions of the image having said predetermined optical spacing behind the image plane,

and means for adjusting the focus of the focussing means in dependence on the focus signal.

4,458,146
PHOTOELECTRIC MOVEMENT DETECTOR WITH VARYING AMPLITUDE LIGHT SOURCE

Robert Reiner, Neubiberg, and Eckart Schatter, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 4, 1981, Ser. No. 259,820
Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3017862
Int. Cl.³ G01V 9/04
U.S. Cl. 250—221 9 Claims

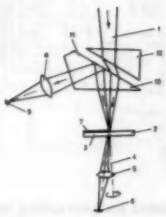


1. Device for determining movements with light, comprising a light transmitter for radiating light pulses with steeply rising and gradually falling slopes, a light receiver for receiving said light pulses radiated by said light transmitter, said pulses being attenuated by objects which may be present between said light transmitter and receiver, said light receiver including an evaluation threshold device for digitally measuring the duration of individual light pulses above a given threshold, said duration measurements varying in proportion to the attenuation of said pulses, and an evaluation stage connected to said light receiver for storing said duration measurements and for comparing said duration measurements with each other.

4,458,147
APPARATUS FOR EVALUATING OPTICAL SIGNALS

Georg Vogl, Saltsjöbaden; Bo Möller, Bromma; Erland Pettersson, and Arnold Johansson, both of Karlskoga, all of Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Oct. 30, 1981, Ser. No. 316,719
Claims priority, application Sweden, Oct. 31, 1980, 8007671
Int. Cl.³ G01D 5/36
U.S. Cl. 250—233 5 Claims



1. An apparatus for evaluating optical signals, comprising:

a rotatable chopper having a transparent part through which a first portion of said signals can pass and an opaque reflective part from which a second portion of said signals is reflected;

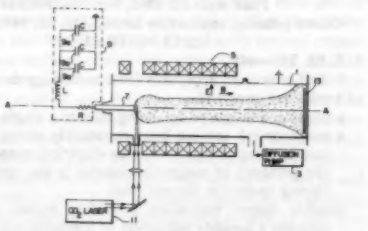
prism means for transmitting said signals to said chopper and for reflecting said second portion of said signals following reflection thereof by said opaque reflective part of said chopper, said prism means including a first prism having a single surface which both transmits said signals to said chopper and reflects said second portion of said signals; and

means for detecting said first and second portion of said signals.

4,458,148
METHOD AND APPARATUS FOR SEPARATING SUBSTANCES OF DIFFERENT ATOMIC WEIGHTS USING A PLASMA CENTRIFUGE

Jay L. Hirshfield, Hamden, and Mahadevan Krishnan, New Haven, both of Conn., assignors to Omega-P, Inc., New Haven, Conn.

Filed Jun. 22, 1981, Ser. No. 276,087
Int. Cl.³ H01J 49/26, 27/24, 1/24
U.S. Cl. 250—284 11 Claims



1. An apparatus for centrifugally separating substances of different atomic weights, said apparatus comprising:

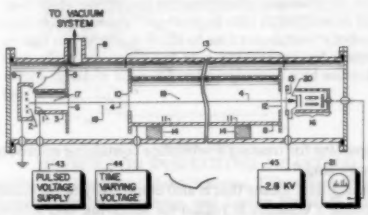
(a) vessel means having a longitudinal axis;
(b) vacuum means for creating a vacuum in said vessel means;
(c) magnetic field generating means for generating a magnetic field in said vessel means, parallel to the longitudinal axis of said vessel means;
(d) target means comprised of said substances, said target means being positioned within said vessel means at one end thereof;
(e) collector means positioned within said vessel means at the other end thereof;
(f) plasma initiation means operably associated with said target means for ionizing at least a portion of said substances and forming a plasma therefrom; and
(g) power supply means connected to said target means for providing an electric current thereto wherein the current flow through said target means causes the further ionization of said substances to fully ionize said substances and form a fully ionized plasma therefrom;
(h) wherein said fully ionized plasma is rotated and moved from said target means to said collector means by said magnetic field such that at least a portion of said ionized substances are separated by the centrifugal force resulting from the rotation thereof.

4,458,149

TIME-OF-FLIGHT MASS SPECTROMETER

M. Luis Muga, Gainesville, Fla., assignor to Patrick Luis Muga, Gainesville, Fla.

Filed Jul. 14, 1981, Ser. No. 283,359
Int. Cl.³ H01J *49/40*
U.S. Cl. 250—287 **10 Claims**



1. A pulsed-beam time-of-flight mass spectrometer having a vacuum housing, a pulsed ion source, an ion extraction means, an acceleration stage, a subsequent ion drift region and a detector, wherein the improvement comprises, as the acceleration stage:
(a) a pre-acceleration flight distance over which an extracted ion bunch passes and in so doing achieves partial separation into iso-mass ion packets; followed by
(b) an ion acceleration region; and
(c) a means for supplying, during each cycle of operation, a time-dependent and monotonically time-varying electromagnetic acceleration field over said acceleration region for achieving both velocity compaction and space compaction of a multiplicity of transiting ions of various masses, thereby resulting in improved mass resolution.

4,458,150

MASS SPECTROMETER

Hisashi Matsuda, Takarasuka, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 19, 1982, Ser. No. 360,005
Claims priority, application Japan, Mar. 23, 1981, 56-42748
Int. Cl.³ B01D *59/44*; H01J *49/30*
U.S. Cl. 250—298 **4 Claims**

1. A mass spectrometer comprising a source for generating ions, a means for separating the ions according to mass, and means for detecting the separated ions, said means for separating ions comprising a sector type homogeneous magnetic field, the magnetic field having a deflection angle ranging from 110 to 135 degrees, and an incident surface for entering ions from

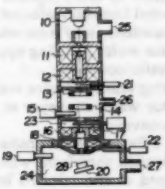
the source and an exit surface for exiting ions to the detecting means, the ions crossing the incident and exit surfaces at respective incident and exit angles equal to each other and ranging from 40 to 60 degrees from the normal.

4,458,151

ELECTRON MICROSCOPE OF A SCANNING TYPE

Hirotami Koike, 2741-7, Hane, Hamura-cho, Nishitama-gun, Tokyo; Takashi Yanaka, 476, Hodokubo, Hino-shi, Tokyo, and Masaru Watanabe, 17-34, Shimorenjaku 6-chome, Mitaka-shi, Tokyo, all of Japan

Continuation of Ser. No. 326,763, Dec. 2, 1981, which is a continuation of Ser. No. 133,818, Mar. 25, 1980, abandoned.
This application Sep. 30, 1982, Ser. No. 430,617
Claims priority, application Japan, Apr. 10, 1979, 54-42506
Int. Cl.³ G01N *23/00*
U.S. Cl. 250—310 **3 Claims**



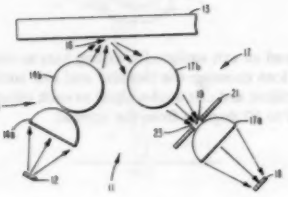
1. An electron microscope of a scanning type which can observe the images of different specimens selectively or interchangeably through scanning with the electron beam having an electronic optical system which comprises an electron gun (**10**), a first objective lens (**16**) for observing a specimen of small size, a second objective lens (**18**) for observing a specimen of large size and disposed in axial opposition to said electron gun with said first objective lens, a first specimen table (**17**) set in a first specimen chamber (**23**) disposed adjacent to said first objective lens for presenting a small size specimen between magnetic poles of said first objective lens, detection means to detect secondary electrons emitted from a specimen placed on said first specimen table, a second specimen table (**20**) set in a second specimen chamber (**24**) disposed below said second objective lens and which is far larger in construction than said first specimen chamber for presenting a large size specimen at a location in the vicinity of the focal plane of said second objective lens, detection means to detect secondary electrons emitted from a specimen placed on said second table, first and second deflecting coils (**13**) and (**14**) disposed between said electron gun and said first specimen table so that two-dimensional scanning of the specimen with the electron beam is attained, and a third deflecting coil (**29**) disposed between said first objective lens and second objective lens so that the electron beam having been two-dimensionally scanned by first and second deflecting coils (**13**) and (**14**) is scanned in a wide area in said second specimen chamber.

4,458,152

PRECISION SPECULAR PROXIMITY DETECTOR AND ARTICLE HANDING APPARATUS EMPLOYING SAME

Anthony C. Bonora, Atherton, Calif., assignor to Siltec Corporation, Menlo Park, Calif.

Filed May 10, 1982, Ser. No. 376,299
Int. Cl.[3] G01P 13/00; B65H 7/14
U.S. Cl. 250—353 21 Claims



1. A specular proximity detecor comprising:
means for directing radiation along an incidence path to a line substantially free of optical diffusion extending for a length transverse to said incidence path at a selected location along said incidence path;
a radiation sensor; and
a first converging line-focusing optical element disposed along a reflection path to intercept radiation reflected from the selected location and direct it to the radiation sensor, the first converging line-focusing optical element positioned along the reflection path relative to the selected location and the radiation sensor to direct a greater amount of radiation to said radiation sensor when such radiation is reflected from said selected location that when reflected from locations away from said selected location.

12. A semiconductor wafer handling apparatus comprising:
a semiconductor wafer conveyor;
means for transferring semiconductor wafers with respect to the semiconductor wafer conveyor at a selected location relative to said conveyor;
means for forming a focused line of radiation at the selected location for reflection therefrom when a semiconductor wafer is positioned at said selected location for transfer with the semiconductor wafer conveyor;
means for receiving reflected radiation and focusing same to a line; and
means for sensing radiation disposed to receive the reflected and line focused radiation and generate an indication of radiation reflected from the selected location.

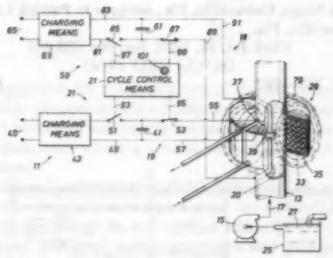
16. A specular proximity detector of integral construction comprising:
a housing defining opposite first and second sides and a third side joining said first and second opposite sides;
first and second converging cylindrical lenses each having a longitudinal axis, said cylindrical lenses mounted adjacent to each other within the housing proximate the third side thereof with their longitudinal axes parallel and extending in the direction of the opposite first and second sides;
the third side of the housing defining an opening exposing the cylindrical lenses to the exterior of said housing, the opening extending a first distance between the opposite first and second sides of the housing to expose a length of the cylindrical lenses and a second distance in the direction between the longitudinal axes of the cylindrical lenses less than the distance separating said longitudinal axes;
a radiation emitter mounted within the housing at a side of the second converging cylindrical lense opposite the opening defined by the third side of the housing to direct radiation towards said second converging cylindrical lens generally in the direction of a radiation incidence path extending through the longitudinal axis of said second converging cylindrical lens, said opening defined by the third side of the housing and a point exterior to the housing at which emitted radiation is focused in a substantially diffusion free manner to a line by said second converging cylindrical lens; and
a radiation sensor mounted within the housing at a side of the first converging cylindrical lens opposite the opening defined by the third side of the housing to receive radiation reflected from the point exterior to the housing generally in the direction of a radiation reflection path extending through said opening defined by the third side of the housing and the longitudinal axis of said first converging cylindrical lens.

4,458,153

ORGANISM DESTRUCTION BY ELECTROHYDRAULIC DISCHARGE WITHIN A PULSED MAGNETIC FIELD ENVELOPE

Richard H. Wesley, 19511 Ricelake La., Houston, Tex. 77084

Filed Sep. 13, 1982, Ser. No. 416,946
Int. Cl.[3] G01N 21/01
U.S. Cl. 250—435 37 Claims



1. Apparatus for treating a substance containing microorganisms comprising:
a. nonmagnetic means that is also electrically nonconductive defining a volumetric region for receiving said substance;
b. electrohydraulic discharge generating means including a plurality of electrohydraulic electrodes communicating with said volumetric region so as to be able to generate an electrohydraulic discharge within said volumetric region and pass an electrohydraulic shock wave through any substance therein; said electrohydraulic discharge generating means being capable of generating an electrohydraulic discharge of an intensity sufficient to kill said microorganisms in said substance;
c. magnetic field generating means disposed adjacent said nonmagnetic means so as to be able to pass a physical magnetic field into said volumetric region; said magnetic field generating means being capable of generating a physical magnetic field of an intensity at least sufficient to contain and direct said electrohydraulic discharge;
d. flow means for passing said substance through said volumetric region; and
e. cycle control means connected with said magnetic field generating means and with said electrohydraulic discharge generating means for causing said magnetic field generating means to generate said physical magnetic field and for causing said electrohydraulic discharge generating means to generate said electrohydraulic discharge within and conjointly with said physical magnetic field at a frequency great enough to ensure that every differential volume of said substance is subjected to at least one said electrohydraulic discharge and physical magnetic field.

4,458,154

APPARATUS FOR ACCUMULATION AND STORING LIGHT ENERGY AND RELEASING THE SAME THEREFROM FOR UTILIZATION

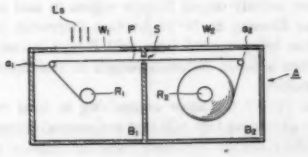
Toshio Sugita, 17-12, Takamatsu-cho 2-chome, Tachikawa-shi, Tokyo, and Masahide Kamiyama, 24, Naka-cho, Shinjuku-ku, Tokyo, both of Japan

Division of Ser. No. 188,868, Sep. 19, 1980. This application Apr. 26, 1983, Ser. No. 488,715

Claims priority, application Japan, Sep. 21, 1979, 54-120836

Int. Cl.³ G01J *1/58*; G01N *21/64*

U.S. Cl. 250—484.1 **7 Claims**



1. An apparatus for accumulating and storing light energy and releasing the same therefrom, comprising in combination:

a first chamber and a second chamber separated from each other by an isolation wall, each of said chambers having first and second windows, respectively, through which light ranging in wavelength from ultraviolet to infrared passes into or out of said respective chambers;

first and second rotary shafts disposed respectively in said first and second chambers;

a light adsorbing means, the extremities of which are fixed to each of said first and second shafts respectively, such that said means passes from one of said chambers to the other of said chambers in front of said respective windows, said first chamber being set at a predetermined temperature which is lower than the temperature of said second chamber.

4,458,155

DEVICE FOR INSPECTING A CASTING

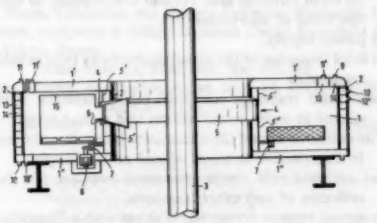
Hans Gruner, Duisburg; Hans Schrewe, Düsseldorf; Fritz-Peter Pleschiutschnigg, Duisburg, and Lothar Parschat, Essen, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 7, 1982, Ser. No. 337,622

Claims priority, application European Pat. Off., Jan. 12, 1981, 81730005.6

Int. Cl.³ G01N *21/32*; H04N *7/18*

U.S. Cl. 250—572 **12 Claims**



1. An apparatus for inspecting the surface of a casting after having emerged from a mold in a machine for continuous casting, the casting moving along on axis, comprising:

a basically ring-shaped housing arranged concentric to said axis and having an inside wall facing the casting centrally passing through the space surrounded by the ring, the wall having an annular gap;

a sheet means movably disposed in the housing for closing the gap covering most of the gap, except for a relatively small gap portion and revolving about said axis;

a line scan camera in the housing connected to the sheet means and revolving therewith about said axis, the camera oriented in such a way so that the lines of the scan extend parallel to the axis so that a narrow increment on the casting is inspected for each line scan.

4,458,156

FLYWHEEL PROPULSION SYSTEM FOR AUTOMOTIVE VEHICLES OR THE LIKE

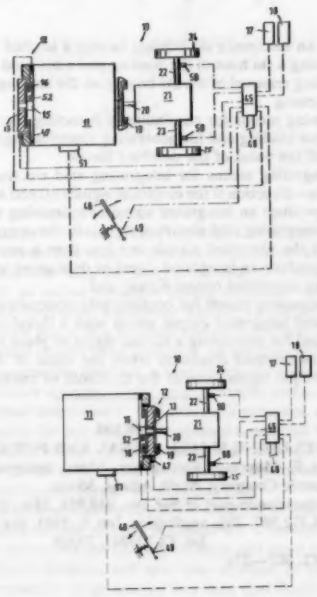
Paul Maucher, Sasbach; Oswald Friedmann, Lichtenau, and Siegfried Sonntag, Vaihingen, all of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Dec. 22, 1981, Ser. No. 333,468

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3048972

Int. Cl.³ B60K *9/04*

U.S. Cl. 290—38 B **26 Claims**



1. A propulsion system, particularly for the wheels of automotive vehicles, comprising a power plant having a stationary component and rotary output means; a starter-generator unit including a flywheel coaxial with said output means, first clutch means actuatable to connect said output means with said flywheel so that the latter can drive said output means and vice versa, rotor means affixed to said flywheel annular stator means, and means for securing said stator means directly to said component so that the stator means concentric surrounds said rotor means and defines therewith a narrow air gap, said component including a first portion having a supporting surface and a second portion constituting a cover connected to said first portion by said securing means and at least partially surrounding said flywheel, said stator means being disposed between said surface and said second portion; transmission means having rotary input means; and second clutch means actuatable to connect said output means with said input means.

4,458,157

METHOD AND APPARATUS FOR RELEASING A SKI BOOT FROM A SKI

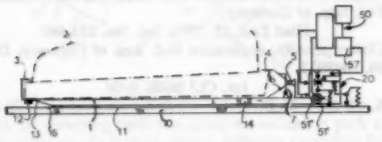
Walter Knabel, Murnau, Fed. Rep. of Germany, and Nicholas F. D'Antonio, Liverpool, N.Y., assignors to Marker-Patentverwertungsgesellschaft mbH., Baar, Switzerland and Kinetronic Industries, Inc., Media, Pa.

Continuation-in-part of Ser. No. 190,862, filed as PCT DE79/00073, Jul. 17 1979, published as WO80/00219, Feb. 21, 1980, § 102(e) date Mar. 19, 1980, abandoned. This application Dec. 17, 1981, Ser. No. 331,754

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831769

Int. Cl.³ H01H *35/00*; A63C *9/08*

U.S. Cl. 307—119 8 Claims



5. An electronic ski binding having a latched condition for retaining a ski boot in the binding and a released condition for enabling removal of the ski boot from the binding, said binding comprising

sensing means for continuously detecting forces applied to the binding and for generating electrical signals reflective of the value of the detected forces;

integrating means for integrating said electrical signals in one direction if the electrical signals exceed a first value to produce an integrated signal of increasing value and for integrating said electrical signals in the opposite direction if the electrical signals are less than a second value to produce an integrated signal of decreasing value, to yield an integrated output signal; and

comparator means for continuously comparing the value of said integrated output signal with a threshold of release; and for generating a release signal to place the binding in the released condition when the value of the integrated output signal exceeds the threshold of release.

4,458,158

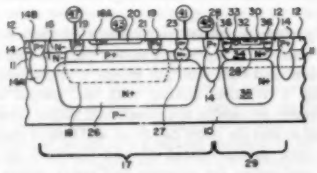
IC INCLUDING SMALL SIGNAL AND POWER DEVICES

James F. Mayrand, Shrewsbury, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of Ser. No. 019,971, Mar. 12, 1979, Pat. No. 4,272,307. This application Jun. 8, 1981, Ser. No. 271,724

Int. Cl.³ H01L *27/04*

U.S. Cl. 307—270 10 Claims



1. An integrated circuit comprising a P-type silicon substrate; a first and second lightly doped N-type epitaxial layers grown over one face of said substrate, one and another isolated epitaxial pockets formed in said epitaxial layers and bounded by said substrate; a high power device and a relatively small low power transistor being formed in said one and another pockets, respectively;

said high power device comprising a first N-type buried layer having been heated and driven from the interface, between said substrate and said first epitaxial layer, deeply downward into said substrate but substantially less deeply upward and only partially through said first epitaxial layer in said one pocket;

a P-type buried layer extending upward from said interface and through an inner region of and only slightly beyond said first N-type buried layer and into said one epitaxial pocket but not downward beyond said buried N-type layer into said P-type substrate;

an annular P-type sub-isolation wall extending from the outer surface of said second epitaxial layer to said P-type buried layer, enclosing an epitaxial sub-pocket therewithin;

a shallow heavily doped N-type region in said sub-pocket surface forming an N^+N junction therewith, said N^+N junction being spaced from said P-type buried layer by less than a holes diffusion length in said lightly doped sub-pocket;

said low power transistor comprising at least one doped region extending into said first and second epitaxial layers from the common boundary there between.

4,458,159

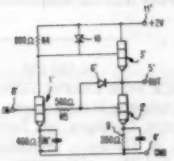
LARGE SWING DRIVER/RECEIVER CIRCUIT

Richard R. Konian, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 25, 1982, Ser. No. 392,189

Int. Cl.³ H03K *19/013*, *3/01*

U.S. Cl. 307—270 10 Claims



1. A driver circuit comprising

a first resistor,

a first pair of transistors,

the base of one of said transistors being directly connected to an input terminal and, via said first resistor, to the base of the other of said transistors,

a power supply,

a third transistor of the same conductivity type as said pair of transistors,

said third transistor and said other transistor being connected in series circuit across said power supply,

the collector of said third transistor being directly connected to a respective terminal of said power supply,

an antisaturation diode connected between the base and collector of said other transistor,

a second resistor connected in shunt with a clamping means,

said second resistor connecting the junction of the collector of said one transistor and the base of said third transistor with the collector of said third transistor, and

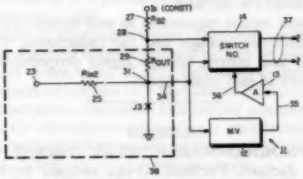
a third resistor interconnecting the emitters of said one and said other transistors,

said power supply biasing said driver circuit so that substantially no current flows through at least said other transistor during the lowest voltage excursion of the input signal applied to said input terminal.

4,458,160
HIGH GAIN JOSEPHSON JUNCTION VOLTAGE AMPLIFIER

Richard M. Josephs, Willow Grove, and Tsing-Chow Wang, Norristown, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Nov. 19, 1981, Ser. No. 323,144
Int. Cl.³ H03K *3/38*
U.S. Cl. 307—306 **9 Claims**



1. A superconducting Josephson junction voltage amplifier circuit of the type maintained in a cryogneic container during operation, comprising:

a voltage input node in said cryogenic container for receiving a voltage input signal,

an input impedance connected to said voltage input node,

a single Josephson junction branch connected to said input impedance, said branch comprising in series a source resistor external to said cryogenic container, and inside said cryogenic container an output impedance and a Josephson junction device,

said imput impedance being connected to the connection between said Josephson junction device and said output impedance,

a current source connected to said Josephson junction branch at said source resistor,

a first voltage output node intermedidte said external source resistor and said internal output impedance,

a second voltage output node intermediate daid internal output impedance and said Josephson junction device,

external voltage sensing means connected to said first and said second voltage output nodes for detecting an amplified differential voltage generated across said output impedance only when said Josephson junction device switches from a zero resistance state to a voltage gap state, and

means for sensing when said Josephson junction device is switching connected to said external voltage sensing means.

4,458,161
ELECTRET DEVICE

Hiroto Wada, Yokosuka, and Shigeru Fujiwara, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1982, Ser. No. 377,798
Claims priority, application Japan, May 14, 1981, 56-72620
Int. Cl.³ G11C *13/02*
U.S. Cl. 307—400 **10 Claims**

1. An electret device comprising:

a dielectric body provided with a surface electric charge and adapted to retain said charge when the electret device is not in operation, said body having two substantially flat and generally parallel surfaces;

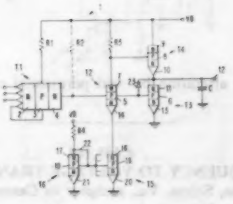
a conductive electrode having a substantially flat surface which is rigidly secured on one of said flat surfaces of the dielectric body, said conductive electrode forming an integral part of the electret device; and

a plurality of cover bodies rigidly attached on the opposite one of said flat surfaces of the dielectric body, said plurality of cover bodies being laterally spaced apart and being electrically isolated from each other during operation of the device, and said cover bodies forming an integral part of the electret device, whereby the electret device possesses a substantially uniform surface charge distribution.

4,458,162
TTL LOGIC GATE

Paul M. Solomon, Yorktown Heights, N.Y., and Siegfried K. Wiedmann, Stuttgart, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 10, 1981, Ser. No. 282,110
Int. Cl.³ H03K *19/088, 19/013*
U.S. Cl. 307—456 **4 Claims**



1. A logic gate comprising:

an input transistor having a base terminal, a collector terminal and at least one emitter terminal connected to an input node, said base terminal being connected to a source of potential, an output transistor having an emitter terminal connected to ground, a collector terminal connected to an output node and a base terminal connected to said collector terminal of said input transistor, an inverter transistor having an emitter terminal, a base terminal connected to said collector terminal of said input transistor and a collector terminal connected to said source of potential, a pull-up transistor having an emitter terminal connected to said output node, a base terminal connected to the collector terminal of said inverter transistor and a collector terminal connected to said source of potential, and,

a current mirror circuit electrically connected to said emitter terminal of said inverter transistor for controlling the amount of base current flowing between said input transistor collector terminal and said base terminal of said inverter transistor to an amount less than that flowing between said input transistor collector terminal and said base terminal of said output transistor.

4,458,163
PROGRAMMABLE ARCHITECTURE LOGIC

Glenn Wheeler, and James F. Ptasinski, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

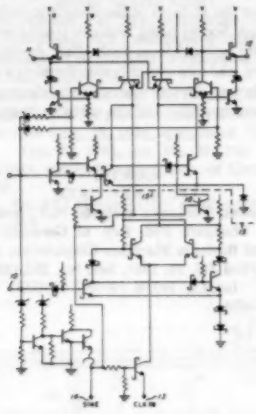
Filed Jul. 20, 1981, Ser. No. 284,431
Int. Cl.³ H03K *17/60, 19/086*
U.S. Cl. 307—466 **8 Claims**

1. An integrated circuit having at least one data input and at least one data output comprising:

an alterable logic network connected intermediate said input and said output for performing a selected logic operation of a plurality of logic operations; and

circuitry operatively connected to said alterable logic network to permanently configure said alterable logic net-

work, wherein said alterable logic network is configured to periodically register input data applied to said input



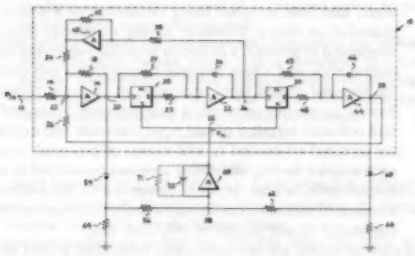
prior to alteration by said permanent configuration circuitry.

4,458,164

FREQUENCY TO VOLTAGE TRANSDUCER

L. Jubin Lane, Salem, Va., assignor to General Electric Company, Salem, Va.

Filed May 28, 1982, Ser. No. 383,076
Int. Cl.³ H03K *11/00, 9/06*
U.S. Cl. 307—519 **8 Claims**



1. A frequency to voltage transducer for producing an output voltage signal having a magnitude proportional to the frequency of an input signal comprising:

(a) a tunable filter circuit for simulating a resistance-inductance-capacitance circuit having a resonant frequency which is adjustable in response to said output voltage signal, said filter circuit comprising,

(1) circuit means for providing at its output a first signal representative of the voltage of the inductance of the simulated circuit in response to said input signal, a signal representing the capacitance voltage and a signal representing the resistance voltage,

(2) a first gain path including first multiplier means responsive to said first signal and said output voltage signal to provide a signal proportional to the product of thereof,

(3) a second gain path for providing an output signal proportional to said first signal,

(4) first integrating means responsive to the output signals of said first and second gain paths to develop a signal proportional to the resistance voltage of the simulated circuit,

(5) third gain path means including second multiplying means responsive to said signal proportional to the resistance voltage and said output voltage signal to provide an output signal,

(6) fourth gain path means for providing an output signal proportional to said signal proportional to the resistance voltage; and,

(7) second integrating means responsive to the output signals of said third and fourth gain paths to develop a signal proportional to the capacitance voltage of said simulated circuit; and,

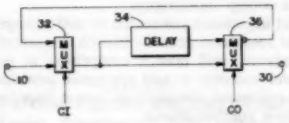
(b) feedback means responsive to said signals representing the inductance voltage and the capacitance voltage to provide said output voltage signal proportional to the frequency of said input signal.

4,458,165

PROGRAMMABLE DELAY CIRCUIT

Ronald M. Jackson, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 23, 1983, Ser. No. 478,606
Int. Cl.³ H03H *7/30*
U.S. Cl. 307—595 **11 Claims**



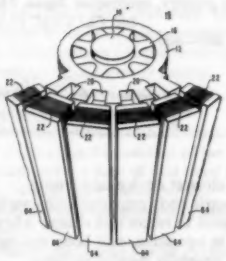
1. A programmable delay circuit, comprising a delay device having an input port and an output port, and a multiplexer having a first input port connected to the input port of the delay device, a second input port connected to the output port of the delay device, and an output port, said multiplexer being operative to connect selectively either the first input port or the second port of the multiplexer to the output port, thereof, whereby the circuit can be programmed and provide delay time from the input port of the delay device to the output port of the multiplexer either including or excluding the propagation delay of the delay device.

4,458,166

DYNAMOELECTRIC MACHINE WITH A SALIENT POLE ROTOR

Richard D. Nathenson, Pittsburgh; Charles W. Pipich, Moaroeville, both of Pa., and Joseph R. Kopnitsky, deceased, late of Trafford, Pa. by Mary C. Kopnitsky, executrix, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 31, 1981, Ser. No. 249,306
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—71 **9 Claims**



1. An electrical connection system for a rotor of a dynamo-

electric machine having a rotatably mounted shaft, a generally cylindrical member mounted on said shaft, said cylindrical member having one peripheral surface and at least one planar surface, said cylindrical member being coaxial with said shaft, said electrical connection system comprising;

a plurality of salient poles, each of said salient poles disposed about said generally cylindrical member;

a plurality of rigid conductive leads;

a plurality of rigid conductive tabs, each of said tabs being connectable to a preselected one of said plurality of rigid conductive leads;

a plurality of identically wound field coils, each of said field coils disposed about a preselected one of said plurality of salient poles, each of said field coils comprising a first terminus connected to a first connection point and a second terminus connected to a second connection point;

means for electrically connecting a preselected one of said first and second connection points to a preselected one of said plurality of rigid conductive tabs;

means for mechanically fastening a preselected one of said rigid conductive leads to said generally cylindrical member;

means for preventing electrical communication between a preselected one of said plurality of rigid conductive leads and said generally cylindrical member;

means for preventing electrical communication between a preselected two of said plurality of rigid conductive leads; and

a preselected first one of said plurality of rigid conductive leads being associated with a preselected second one of said plurality of rigid conductive leads in an electrical connection assembly, said second lead forming an overlap of said first lead, said mechanical fastening means being disposed proximate said overlap and mechanically fastening said first and second leads to said generally cylindrical member, said first and second leads being disposed generally parallel to said planar surface of said generally cylindrical member, a preselected one of said tabs being connected to said first conductive lead proximate said overlap, a preselected one of said tabs being connected to said second conductive lead proximate said overlap, a preselected one of said electrically connecting means being connected to both a preselected one of said first and second connection points and a preselected one of said tabs, said preselected one of said tabs being most proximate to said preselected one of said first and second connection point.

4,458,167

D. C. ELECTRIC MOTOR WITH IMPROVED STATOR AND ROTOR STRUCTURE

Gilles Leveille, 215, rue Mercier, Drummondville, Quebec, Canada (J2B 5G2)

Continuation of Ser. No. 208,078, Nov. 18, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 428,543

Claims priority, application Canada, May 7, 1980, 351410

Int. Cl.³ H02K *17/00*

U.S. Cl. 310—166 **13 Claims**

1. An electric motor comprising:

(a) a rotor rotating around an axis,

(b) a stator positioned around said axis,

(c) each of said rotor and said stator including a set of dipolar pieces distributed around its respective periphery,

(d) a first of said sets being inside a circle centered on said axis and located in a plane perpendicular to the axis of the rotor, and a second of said sets being outside of said circle,

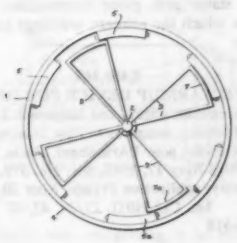
(e) said first and second sets having a different number of dipolar pieces,

(f) controlling means associated with one of said first and second sets, said controlling means supplying electric power to said dipolar pieces of said one set for selectively magnetizing these dipolar pieces and forming a rotating magnetic field,

(g) each of said dipolar pieces of said one set comprising a separate magnetic core which is substantially E-shaped in cross section, which cross section is perpendicular to the circumference of said circle, said E-shaped magnetic core opening towards said circle and defining a central protuberance, and first and second outer protuberances,

(h) each of said dipolar pieces of said one set also comprising at least one coil wound around said central protuberance of said magnetic core, said coil being associated with said controlling means so as to create the rotating magnetic field,

(i) each of said dipolar pieces of the other set amongst said first and second sets comprising a magnetic core which, during rotation of said rotor, defines, with the magnetic core of any dipolar piece of said one set confronting at least in part said dipolar piece of said other set, two magnetic circuits nearly surrounding the coil of the confronting piece of said one set, through which magnetic circuits are respectively flowing two loops of magnetic flux generated by this coil upon energization of this coil by said



controlling means, one of said magnetic circuits being defined through the magnetic core of said dipolar piece of said other set, and through the central protuberance and the first outer protuberance of said confronting dipolar piece of said one set, and the other of said magnetic circuits being defined through the magnetic core of said dipolar piece of said other set, and through the central protuberance and the seconnd outer protuberance of said confronting piece of said one set,

(j) said dipolar pieces being spaced apart whereby the magnetization of one of said dipolar pieces of said one set associated with the control means forms, with one of the dipolar pieces of said other set, said magnetic circuits,

(k) said magnetic circuits acting to try to close themselves and thus providing a lever force which causes rotation of said rotor,

whereby, in operation, the magnetic flux generated by the coil of each dipolar piece of said one set is used in a very efficient way to produce said lever force.

4,458,168

TOOTHED RELUCTANCE SYNCHRO/RESOLVER

Ross D. Welburn, Santa Rosa, Calif., assignor to Motornetics Corporation, Santa Rosa, Calif.

Filed Sep. 12, 1983, Ser. No. 531,292

Int. Cl.³ H02K *1/00*; H01F *21/00*

U.S. Cl. 310—185 **6 Claims**

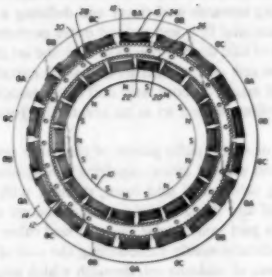
1. Synchro/resolver apparatus comprising

a stator assembly having a succession of pole pieces, each pole piece having a plurality of spaced apart pole piece teeth,

a rotor having a plurality of pole piece teeth corresponding to the stator teeth and positioned juxtaposed to the stator poles,

a plurality of primary windings, each being wound on a separate stator pole piece in such a fashion as to induce

alternately polarized magnetic fields in each successive pole piece on which a primary winding is wound, and



a plurality of secondary windings, each being wound on a separate stator pole piece intermediate the stator pole pieces on which the primary windings are wound.

4,458,169

MICROWAVE WARMUP DEVICE FOR HF RESONATOR

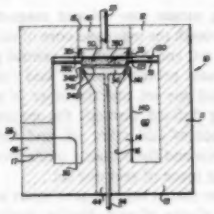
Michael D. Décailliot, Pirey, and Raymond J. Besson, Besancon, both of France, assignors to Etat Francais represente par le Delegue General pour l'Armement, Paris, France

Filed May 17, 1982, Ser. No. 379,102

Claims priority, application France, May 20, 1981, 81 10006

Int. Cl.³ H01L *23/34, 41/00*

U.S. Cl. 310—315 **18 Claims**



1. A method for fast warm-up of a HF resonator, said resonator comprising a piezoeletric crystal which cooperates with at least a pair of energizer electrodes generating a HF electric field to enter into resonance at a predetermined frequency FQ, said method comprising the step of creating a supplementary UHF electric field around said resonator having a frequency F higher than said resonance frequency FQ of said resonator.

4,458,170

ULTRASONIC TRANSMITTER-RECEIVER

Ryoichi Takayama, Suita, and Yukihiko Ise, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 8, 1981, Ser. No. 328,698

Int. Cl.³ H04R *17/00*

U.S. Cl. 310—322 **3 Claims**

1. An ultrasonic transmitter-receiver comprising:

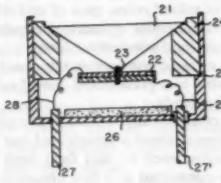
a laminated piezo-electric element,

a diaphragm at a central portion of said laminated piezo-electric element,

a housing means for accommodating said laminated piezo-electric element therein,

an elastic buffer member disposed in bridging contact between a peripheral portion of said diaphragm and an inner side wall of said housing, wherein said diaphragm is flexibly fixed and held within said housing through the use of said elastic buffer member, and

an acoustic absorbent disposed on the bottom of said housing



but spaced out of contact from said laminated piezo-electric element,

whereby there is an improvement in pulse characteristics, such as rise time.

4,458,171

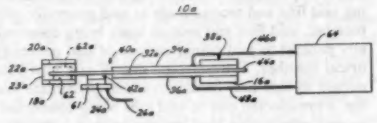
PIEZOELECTRIC RELAY WITH TAPERED MAGNETIC DETENT

Eric A. Kolm, Brookline, and Henry H. Kolm, Wayland, both of Mass., assignors to Piezo Electric Products, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 338,228, Jan. 11, 1982. This application Dec. 15, 1982, Ser. No. 448,471

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—330 **24 Claims**



1. A magnetically detented piezoelectric relay comprising:

a piezoelectric bender element having a fixed portion and a movable portion;

means for providing an actuating voltage to deflect said bender element;

first contact means mounted on said movable portion and second stationary contact means remote from said bender element and proximate said first contact means for selective engagement therewith in response to deflection of said bender element; and

magnetic circuit means including a magnet; a first stationary pole member; and a second pole member on said movable portion for magnetically adhering said movable portion to said first stationary pole member until the deflection force of said bender element exceeds the holding force of said magnetic circuit, one of said pole members being convergingly tapered toward its face.

4,458,172

ULTRASONIC PROBE

Hiroshi Takeuchi, Matsudo; Yukio Ito, Sayama; Etsuji Yamamoto, Hachioji; Shigeru Jyomura, Tokyo, and Sakichi Ashida, Fuchu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

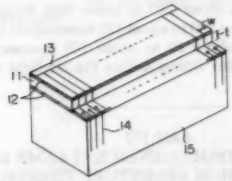
Filed Aug. 6, 1982, Ser. No. 406,015

Int. Cl.³ G10K *11/36*; H01L *41/18*

U.S. Cl. 310—334 **3 Claims**

1. An ultrasonic probe having resonators which comprise a plurality of rectangular strips arranged to form a one-dimensional array, made of a piezoelectric ceramic material, wherein said piezoelectric ceramic material is made by subjecting a ceramic material containing 44.7 to 46.3 mol% of PbO,

50.9 to 51.7 mol% of TiO_2, 1.8 to 2.6 mol% of Sm_2O_3 and 0.5 to 1.0 mol% of MnO to poling treatment in such a manner that said ceramic material is applied with an electric field of 60 to 80 kV/cm at a temperature of 130° to 160° C. to thereby enhance the ratio K_t/K_p of an electromechanical coupling factor K_t of



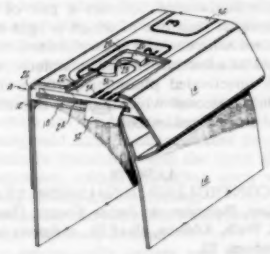
thickness dilatational vibration to an electromechanical coupling factor K_p of lateral vibration to ensure high frequency operation of the probe wherein the ratio of the width w of each rectangular strip to the thickness t thereof is in a range of from 0.8 to 3.0 and wherein said poling treatment provides a ratio K_t/K_p of greater than 10.

4,458,173

PRESSURE SENSITIVE ELECTRIC SIGNAL GENERATOR

Peter Kaufman; John J. Sharkey, both of Santa Barbara, and John Echols, Ventura, all of Calif., assignors to Essex-Tec Corporation, Carpinteria, Calif.

Filed Feb. 4, 1983, Ser. No. 463,963
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—338 **7 Claims**



2. Apparatus for generating an electric signal with piezoelectric material comprising:

a strip of bendable metal having an outer surface and an inner surface;

a strip of stiff metal which cooperates with the bendable metal and forms therebetween a cavity;

at least one region of piezoelectric material having a top surface and a bottom surface;

a nonconductive substrate having a top and a bottom;

an electrically conductive lead attached to and extending from the bottom surface of the piezoelectric to an edge of the substrate;

conductive material bonding the bottom of the piezoelectric material to the top of the substrate and forming a conductive path between the piezoelectric material and the lead;

conductive material bonding the top surface of the piezoelectric material to the inner surface of the bendable metal;

a ribbon cable extending from the edge of the substrate and together with the lead and the piezoelectric material forming a continuous electric circuit;

a sheet of compressible elastomeric material adjacent to the bottom of the substrate;

means for bonding the compressible elastomeric material to the bottom of the substrate;

means for bonding the compressible elastomeric material to the sheet of stiff material; and

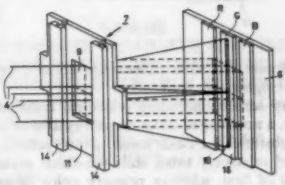
means for bonding the top of the substrate to the inner surface of the bendable metal.

4,458,174

COLOR DISPLAY TUBE

Abraham A. De Keijzer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 30, 1980, Ser. No. 154,631
Claims priority, application Netherlands, Jun. 14, 1969, 7904653
Int. Cl.³ H01J *29/07*
U.S. Cl. 313—402 **8 Claims**



1. A color display tube comprising, in an evacuated envelope:

means for generating a number of electron beams;

a display screen having a multiplicity of regions luminescing in different colors when struck by beams from said means; and

color selection means positioned in the path of said beams between said generating means and said display screen for associating each electron beam with luminescent regions of one color, said selection means including:

a first and a second set of lens electrodes, said first electrode set including a metal plate having a multiplicity of apertures arranged in a plurality of substantially parallel, spaced rows, said second set including a plurality of electrically conductive strips;

a first layer of adhesive material provided on said plate in said spaces between said rows, and a second layer of adhesive material provided on said strips on the sides of the strips facing said plate; and

a multiplicity of insulating carriers fixed to said strips and to said plate by said respective adhesive layers so that said strips are spaced from said plate by said carriers,

characterized in that said plate has a groove extending longitudinally of said strips in each of said spaces between said parallel rows, and said strips have a longitudinally extending groove in each of said sides facing said plate, a groove in said strip facing a respective groove in said plate,

in that each of said carriers engages a groove in said plate at two locations only and the respective groove in said strip at two locations only, and,

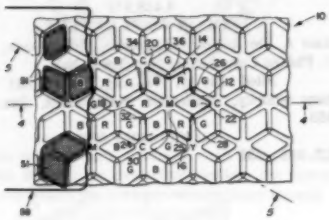
in that the adhesive material provided on the electrode set intended for application of a lower potential in the normal operation of the tube is an electrically conductive adhesive consisting essentially of particles having a ruthenium oxide layer of a thickness between 0.5 and 100 nanometers,

whereby said strips are accurately positioned between said parallel apertured rows and flash-over between said electrode sets in normal operation is reduced.

4,458,175
MOSAIC ADDITIVE REFLECTANCE COLOR DISPLAY SCREEN

Robert R. Weekley, 23662 Coronel Dr., Mission Viejo, Calif. 92691

Continuation-in-part of Ser. No. 787,097, Apr. 13, 1977, abandoned, and a continuation-in-part of Ser. No. 455,025, Mar. 29, 1974, abandoned. This application Apr. 9, 1979, Ser. No. 28,191
Int. Cl.³ H01J 29/10
U.S. Cl. 313—472 10 Claims



1. A Mosaic Additive reflectance color display screen of enhanced brightness, comprising:

a display screen, including a neutral color-reflective substrate, a nonimaged color mosaic system of color areas on the substrate, the color areas of the system being discrete and of relatively small size; the color areas being comprised of first, additive primary color areas being separated from each other by second, subtractive primary color areas;

a separation record means superimposed upon said system of color areas and being composed of discrete areas outlining and defining an image and acting to selectively alter the optical density of individual ones of the color areas of the system so that, upon illuminating the screen by ambient light, an image, corresponding in both color and pattern to an original image, can be seen by an observer, whereby the small size areas, as seen, act additively to the eye.

4,458,176
DAYLIGHT FLUORESCENT LAMPS EMPLOYING BLEND

Charles F. Chenot, Towanda, Pa., and Wolfgang Walter, Brookline, Mass., assignors to GTE Products Corporation, Stamford, Conn.

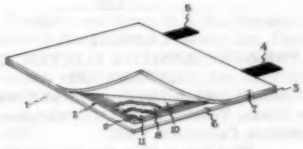
Continuation-in-part of Ser. No. 830,796, Sep. 6, 1977. This application Jun. 22, 1979, Ser. No. 51,305
Int. Cl.³ H01J 1/62
U.S. Cl. 313—487 3 Claims

1. A fluorescent lamp comprising a sealed envelope, electrodes therein, a filling of an inert gas, and a mercury therein, and a coating of a phosphor component on the inside surface of said envelope, characterized in that said phosphor component consisting essentially of from about 3 to about 60 weight percent of a blue emitting phosphor having the formula, $Sr_{5-x-y}Ba_xEu_yCl(PO_4)_3$, wherein x is from 0.5 to about 3.0 and y is from about 0.005 to about 0.15 and having a peak emission of from about 440 to about 450 nanometers and a 50% bandwidth of from about 25 to about 65 nanometers and the balance being a yellow emitting phosphor composition having the formula, $Ca_{5.0-a-w-x-y}Sr_aCd_wMn_xSb_y(PO_4)_3F_{1-y}O_y$, a is from 0 to about 5.0w-x-y, w is from 0 to about 0.05, x is from about 0.005 to about 0.17, y is from about 0.02 to about 0.04, having a peak emission of from about 540 to about 570 nanometers and a 50% bandwidth of from about 60 to about 100 nanometers, said lamp exhibiting a color falling within the daylight ellipse on the CIE diagram.

4,458,177
FLEXIBLE ELECTROLUMINESCENT LAMP DEVICE AND PHOSPHOR ADMIXTURE THEREFOR

James W. Hunter, Cleveland, and Francois A. Lavallee, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1980, Ser. No. 218,931
Int. Cl.³ H01J 1/62, 63/04
U.S. Cl. 313—511 4 Claims

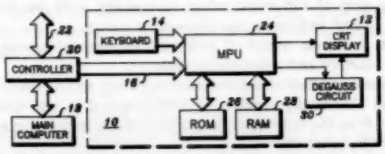


1. In a flexible electroluminescent lamp construction having an electroluminescent cell in the form of an electroluminescent phosphor layer sandwiched between a pair of electrically conductive layers at least one of which is light-transmitting, the improvement wherein said electroluminescent phosphor layer comprises an admixture of electroluminescent phosphor particles with unactivated phosphor particles of the same composition in an amount which reduces the initial current density of said electroluminescent cell.

4,458,178
LOGIC CONTROLLED DEGAUSSING SYSTEM

David L. Tenney, Bolingbrook; James Krause, Hanover Park, and John R. Welk, Addison, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 29, 1982, Ser. No. 426,570
Int. Cl.³ H04N 9/29
U.S. Cl. 315—8 11 Claims



1. A logic controlled degaussing system for a CRT device and comprising:

detector means for detecting signal activity in the device;

timing means coupled to the detector means for providing an output signal in response to a predetermined period of inactivity; and

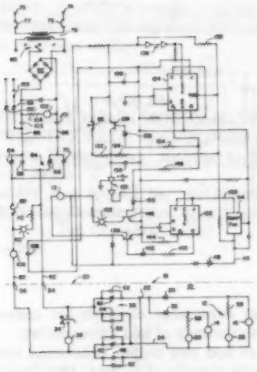
a degaussing circuit for degaussing the CRT in response to the timing means output signal.

4,458,179

CONTROLLER FOR LAMP HAVING MORE THAN ONE LIGHT SOURCE

Richard C. Bainbridge; Richard G. Confer; Carl C. Krihwan, and William R. Miller, all of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Mar. 26, 1982, Ser. No. 362,117
Int. Cl.³ H05B *39/10*
U.S. Cl. 315—88 **3 Claims**



1. A controller for a lamp having more than one light source comprising:

a control box adapted for placement at a location that is remote from the lamp;

means disposed in said control box for reducing the level of the alternating voltage supplied to said controller to at least one level suitable for energizing the light sources;

means for converting said reduced alternating voltage to a direct voltage having a substantially constant amplitude capable of producing an electrical current suitable for energizing the light sources;

bridge-configured switching means having switching devices which can conduct or block electrical current for impressing said direct voltage across two leads which communicate electrically with the lamp, the polarity of said impressed voltage depending upon which of said switching devices are conducting;

means for causing said switching means to reverse the polarity of said impressed voltage;

means for automatically causing said switching means to reverse the polarity of said impressed voltage upon failure of a light source to which said impressed voltage is applied; and

means operatively connected to each light source for permitting current flow through said light source in only one direction, reversal of the polarity of said impressed voltage causing the direction of current flow through the lamp to be reversed and causing one light source to be extinguished and a second light source to be energized.

4,458,180

PLASMA ELECTRON SOURCE FOR COLD-CATHODE DISCHARGE DEVICE OR THE LIKE

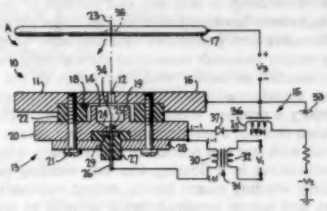
A. Robert Sohval, Cambridge, Mass.; Gerald Cooperstein, Rockville, Md.; David Fleischer, Boxford, Mass.; Shyke A. Goldstein, Gaithersburg, Md., and David R. Hearn, Wellesley, Mass., assignors to Elscint Ltd., Haifa, Israel

Filed Feb. 18, 1982, Ser. No. 349,766
Int. Cl.³ H01J *29/04*
U.S. Cl. 315—111.81 **35 Claims**

1. A plasma electron source for a vacuum device comprising:

(a) a cathode having aperture means;

(b) a housing for defining a cavity behind said aperture means;



(c) a trigger electrode in communication with the cavity, and responsive to a short-duration trigger pulse for establishing plasma in the cavity; and

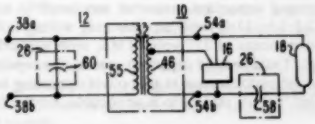
(d) means for confining the plasma to the cavity.

4,458,181

LEAD-TYPE BALLAST APPARATUS WITH IMPROVED POWER FACTOR FOR OPERATING A HIGH-INTENSITY-DISCHARGE SODIUM LAMP

James C. Johnson, Vicksburg, Miss., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 6, 1981, Ser. No. 290,549
Int. Cl.³ H05B *41/16*
U.S. Cl. 315—247 **2 Claims**



1. A lead-type ballast apparatus for operating an HID high-pressure sodium lamp, said lamp having a nominal rated operating wattage and a nominal rated operating voltage, said lamp characteristically displaying an increasing operating voltage throughout its life resulting in established operating standards which specify that the permissible relative wattage and voltage operating characteristics which are experienced throughout lamp operating life fall within the confines an established trapezoidal figure on a graph wherein increasing lamp wattage is linearly plotted on the graph right ordinate and increasing lamp voltage is linearly plotted the graph abscissa, the horizontal parallel sides of the trapezoidal figure being defined by minimum permissible and maximum permissible operating lamp wattages, and the remaining sides of the trapezoidal figure defined by two lines of sharply rising slope wherein small increases in lamp operating voltage are reflected as relatively large increases in operating lamp wattage and which represent minimum permissible lamp voltages and maximum permissible lamp voltages at operating lamp wattages which vary from said minimum permissible to said maximum permissible operating lamp wattages, and the wattage consumption said lamp as a function of the operating voltage of said lamp is describable by a curve on said graph which enters into the trapezoidal figure through said line representing minimum permissible lamp voltages and exits from the trapezoidal figure through said line representing maximum permissible lamp voltages, said lead-type ballast apparatus comprising an inductive reactance portion and a capacitive reactance portion, said inductive reactance portion comprising a current-limiting high-reactance transformer means constructed either as an autotransformer or an isolated transformer; in the case of an autotransformer construction, said transformer means comprising a common winding means including an input section

having input terminals connected thereto, supplemental winding means connecting in circuit with one end portion of said common winding means and terminating in a floating free end winding portion, secondary winding means having one end thereof connecting to said one end portion of said common winding means, the other end of said secondary winding means and the other end portion of said common winding means having output terminals connected thereto, said output terminals connected in circuit with said lamp; in the case of an isolated transformer construction, said transformer means comprising a primary winding means having input terminals connected thereto, a supplemental winding means connecting in circuit with one end portion of said primary winding means and terminating in a floating free end winding portion, and secondary winding means having output terminals connected thereto, said output terminals being adapted to couple in circuit with said lamp, said supplemental winding means being adapted during operation of said ballast apparatus to develop between said free end winding portion and said one input terminal a potential which is substantially greater than the input potential applied across said input terminals, said capacitive reactance portion comprising a first capacitor means of predetermined capacitance in series circuit with said lamp, and second capacitor means of predetermined capacitance connected across said floating free end winding portion of said supplemental winding means and said one input terminal, said second capacitor means having a predetermined capacitance such that said ballast apparatus maintains at least a 0.9 power factor from the point at which said curve enters said trapezoidal figure through said line representing minimum permissible lamp voltages until said curve exits from said trapezoidal figure through said line representing maximum permissible lamp voltage, wherein the ratio of the capacitance of said first capacitor means as measured in microfarads to the capacitance of said second capacitor means as measured in microfarads is from 2.5:1 to 11:1, with an operating voltage of said second capacitor means of 277 volts RMS; with any other operating voltage of said second capacitor means, the capacitance of said second capacitor means at said other operating voltage is first modified, before said ratio is applicable, by the formula:

$$C_2 = \frac{C_2^1 V_{c2}^2}{(277)^2}$$

where V_{c2} is the actual operating voltage of said second capacitor means, C_2^1 is the capacitance of said second capacitor at any other operating voltage and C_2 is the capacitance of said second capacitor means at 277 volts RMS; whereby as said lamp ages and the operating voltage rises, said second capacitor means maintains a relatively high power factor for said ballast apparatus thereby limiting the rise in line current throughout the life of the lamp and reducing low ballast operating losses.

4,458,182

DRIVE DEVICE WITH TWO MUTUALLY COUNTERACTING MOTORS FOR ELIMINATING GEARING BACKLASH

Hans-Jörg Suter, Winkel, and Jürg Wild, Bülach, both of Switzerland, assignors to Contraves AG, Zurich, Switzerland

Filed Jul. 19, 1982, Ser. No. 399,239

Claims priority, application Switzerland, Aug. 14, 1981, 5251/81

Int. Cl.³ G05B *11/32*

U.S. Cl. 318—113 **1 Claim**

1. A high-precision drive decive comprising:

two drive motors;

a respective gearing means for operatively connecting each drive motor with a load movable in both directions of rotation about an axis;

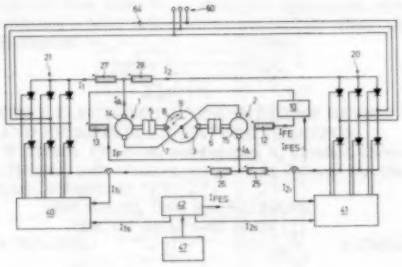
control means to operate said drive motors at least partially in opposition to one another with small summation drive torques for eliminating gearing backlash and to operate said drive motors in the same direction in the presence of large summation drive torques;

each of said drive motors comprising a compound motor;

each of said compound motors having an armature and a shunt winding;

said armatures being connected in series and said shunt windings being connected in series; and

said control means comprising:



two output adjustment elements for controlling series excitation currents of said drive motors;

each one of said two output adjustment elements being operatively connected to said drive motors to apply torque to said drive motors only in one predetermined direction; and

an adjustment element of small output for controlling an external excitation current of said drive motors.

4,458,183

DC MOTOR CONTROL

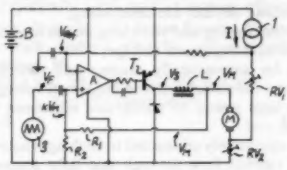
James M. M. Neilson, Edinburgh, Scotland, assignor to The University Court of the University of Edinburgh, Edinburgh, Scotland

Filed Oct. 15, 1982, Ser. No. 434,616

Claims priority, application United Kingdom, Oct. 15, 1981, 8131093

Int. Cl.³ H02P *5/06, 5/00*

U.S. Cl. 318—139 **10 Claims**



1. In a method of energising a DC electric motor having an armature winding and a commutator therefor, which comprises feeding electrical power to a series connection of an inductor and the armature of the motor in unidirectional current pulses at a repetition rate which is large compared to the in-use commutation rate prevailing in the armature winding of the motor, and maintaining current flow in the same direction through said armature winding during the intervals between said pulses, the ratio between the pulse and interval widths being controlled so that the time average voltage applied to the armature winding over many pulses is made equal to the desired motor voltage, the improvement which comprises

(a) generating an operator-variable first reference voltage,

(b) generating a voltage representing at least a proportion of the motor voltage,

(c) superimposing on said generated proportion of the motor

voltage a waveform having a repetition rate which is at least several hundred times the commutation rate prevailing in the armature winding of the motor and having negative- and positive-going ramps, to produce a second reference voltage,

(d) feeding said first and second reference voltages to input terminals of a voltage comparing means, and

(e) generating the current pulses fed to the armature winding via an electronic circuit which includes said voltage comparing means, to effect a switching of the current to the motor each time said second reference voltage traverses said first reference voltage.

4,458,184

BRUSHLESS D.C. MOTOR HAVING ASYMMETRICALLY POSITIONED POLES

Yousuke Kawate, Ikeda, Japan, assignor to Nippon Densan Corp., Kyoto, Japan

Filed Aug. 6, 1982, Ser. No. 405,867
Claims priority, application Japan, May 5, 1981, 56-69892
Int. Cl.³ H02K *29/02*
U.S. Cl. 318—254 **7 Claims**

1. A brushless direct current motor comprising:

an outer rotor for rotation in a first circumferential direction about an axis, the rotor having a first magnetized portion of a first magnetic polarity which extends in a circumferential arc having a first angle;

an inner stator coaxially aligned within the rotor, the stator having a generally cylindrical core and having a first pair of T-shaped poles projecting radially outward from the core and circumferentially spaced from one another in the first circumferential direction by an angle which is greater than the first angle, and having a second pair of T-shaped poles projecting radially outward from the core and circumferentially spaced from one another in the first circumferential direction by an angle which is greater than the first angle, each T-shaped pole having a radially aligned body and a circumferentially aligned head;

an air gap separating an inner surface of the rotor and the heads of the first and second pairs of T-shaped poles;

a first winding wound on the bodies of the first pair of poles to cause the head of a first pole of the first pair of T-shaped poles to have the first magnetic polarity and the head of a second pole of the first pair of T-shaped poles to have a second magnetic polarity when the first winding is energized;

a second winding wound on the bodies of the second pair of poles to cause the head of a first pole of the second pair of T-shaped poles to have the first magnetic polarity and the head of a second pole of the second pair to have the second magnetic polarity when the second winding is energized;

magnetic sensing means for sensing angular position of the rotor; and

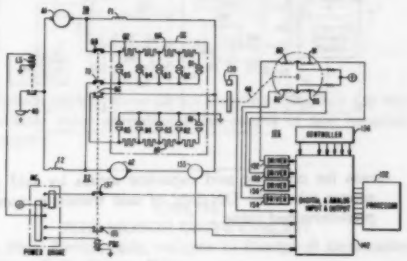
a control circuit connected to and responsive to the magnetic sensing means for alternately energizing the first and second windings in synchronism with the sensed angular position of the rotor to cause rotation of the rotor in the first circumferential direction.

4,458,185

PROPULSION CONTROL APPARATUS FOR PASSENGER VEHICLES

Thomas C. Matty; Dennis E. Whalen, both of North Huntingdon; William E. Schmitz, Wilkinsburg, and Pamela E. DeTine, West Mifflin, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 2, 1983, Ser. No. 500,217
Int. Cl.³ H02P *1/20*
U.S. Cl. 318—270 **10 Claims**



1. A control apparatus for an electric motor operative with a power source for supplying current to determine the operation of that motor in accordance with a plurality of input requested currents corresponding to respective desired motor operations, the combination of:

current control means including a plurality of resistors connected in a series circuit between said power source and the electric motor for establishing the actual electric motor current,

cam controller means coupled with the current control means and movable through successive angular positions for sequentially removing one or more selected resistors from said circuit,

stepping motor means coupled with the cam controller means for providing a predetermined angular position movement of said cam controller means to determine each sequential removal of at least one of said resistors to control the electric motor current, and

control means for establishing an initial position of the cam controller means and responsive to each one of said input requested currents for energizing the stepping motor means when the actual electric motor current is less than said one requested current to determine a predetermined angular position movement of the controller means as required to establish the actual electric motor current to provide the desired electric motor operation corresponding to said one requested motor current.

4,458,186

TRANSISTOR CONTROL DEVICE FOR POWER TRANSISTOR CHOPPER

Shigeru Kuriyama, and Minoru Kaminaga, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 14, 1982, Ser. No. 449,663
Claims priority, application Japan, Dec. 16, 1981, 56-201642
Int. Cl.³ H02P *5/06*
U.S. Cl. 318—341 **7 Claims**

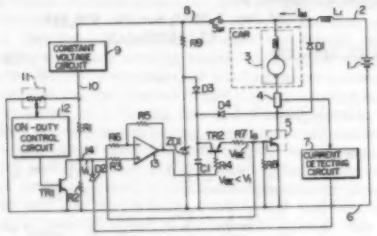
1. A control device for a transistor chopper which controls a load current fed from a DC power source to a load by periodically turning on and off a transistor connected between the DC power source and the load, comprising:

capacitor means for storing electric energy to be used for supplying a base current to control the conduction of said transistor;

means for charging said capacitor means with electrical energy stored in impedance means of the wiring connect-

ing said DC power source to said load when said transistor is OFF;

means connected between said capacitor means and said base of said transistor for controlling the base current suppled from said capacitor means to said transistor; and



means for charging said capacitor means by said power source when the ON-duty of said transistor exceeds a predetermined value.

4,458,187

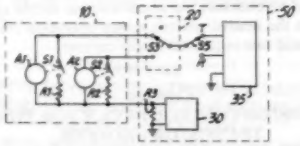
VENDING MACHINE CONTROL AND DIAGNOSTIC APPARATUS

Frederic P. Heiman, Los Gatos, Calif., assignor to Mars, Inc., McLean, Va.

Continuation of Ser. No. 250,385, Apr. 2, 1981, abandoned. This application Jul. 12, 1983, Ser. No. 512,580

Int. Cl.³ G07F 5/22

U.S. Cl. 318—490 **18 Claims**



1. A vending machine apparatus comprising at least one product delevery means, said product delivery means comprising an electrically operated actuator for delivery of products, an impedance element and a circuit opening switch responsive to the position of the actuator, the impedance element and the switch being connected electrically in series with each other and in an electrically parallel circuit with the actuator, the opening and closing of the switch being controlled by the operation of the actuator; and means for detecting and providing a signal indicative of both changes in impedance of the parallel circuit occurring as a result of the opening and closing of the switch and changes occuring as a result of a change in impedance of the actuator.

4,458,188

INDUSTRIAL ROBOT HAVING A FUNCTION FOR CONTROLLING A CURRENT OF A MOTOR FOR DRIVING

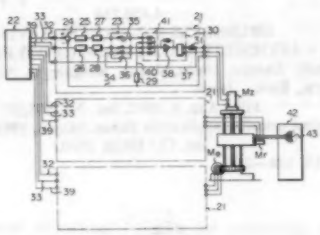
Hajimu Inaba; Hideo Miyashita, both of Hino, and Shoichi Otsuka, Koganei, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

PCT No. PCT/JP81/00237, § 371 Date May 13, 1982, § 102(e) Date May 13, 1982, PCT Pub. No. WO82/01090, PCT Pub. Date Apr. 1, 1982

PCT Filed Sep. 18, 1981, Ser. No. 380,739

Int. Cl.³ G05B 19/42

U.S. Cl. 318—568 **2 Claims**



1. An industrial robot having a function for controlling a current of a motor for driving, having a robot control device, three electric motor control circuits for controlling the positioning of said robot in three directions, and three electric motors driven through said electric motor control circuits, respectively, each of said electric motor control circuits comprising:

an adder means for receiving a position command signal from said robot control device;

a circuit means for summing a plurality of input signals and for receiving the output of said adder; and

an amplifier circuit means for amplifying the output of said summing circuit means, a position feedback signal from a pulse coder linked to said electric motor being fed back to said adder means and said summing circuit means, wherein each of said electric motor control circuits comprises a switching circuit between said adder means and said summing circuit means, said switching circuit receiving the output of said adder means, a current command signal from said robot control device, a current feedback signal corresponding to the drive current of said electric motor, and a switching command signal from said robot control device, said switching circuit being switched so that the output of said adder means is supplied to said summing circuit means at the positioning control, the current command signal and the current feedback signal being then supplied to said summing circuit means at current control.

4,458,189

CONTROL MODE SWITCHING CIRCUIT

John O. Dollerschell, St. Louis Park, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Aug. 6, 1982, Ser. No. 405,866

Int. Cl.³ H02P 5/00

U.S. Cl. 318—591 **7 Claims**

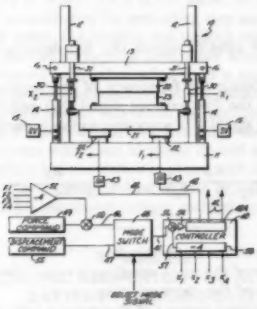
1. A circuit for providing a transfer of input parameters between first and second input signals to provide a command output signal at an output terminal without discontinuity in the output signal during the transfer including means for providing the first and second input signals respectively, a first integrator having first and second inputs, a differential amplifier, first and second switch means, the first switch means being coupled for controlling input of said first signal to the first input of the integrator when closed, the first switch means being open in a

first position and the second switch means then being closed, said second switch means being coupled for connecting the output of said differential amplifier to the first input of said integrator when closed;

the second input of the integrator being connected to a reference;

means connecting the output of the integrator to a first input of said differential amplifier;

third and fourth switch means, said third switch means being open when the fourth switch means is in a closed position and closed when the fourth switch means is open, said third switch means when closed being coupled for connecting the output of the integrator to the output terminal, and said fourth switch means being operable when closed for connecting the second input signal to the output terminal;



means connecting the second input of said differential amplifier to receive the second input signal; and

the second and fourth switch means being closed so that the output of the integrator will be driven in a direction to cause the differential amplifier output to equal the reference at the second terminal of the integrator and therefore the integrated output tending to follow the second input signal so that at the time of switching, when the second and fourth switch means are opened and the first and third switch means are closed, the integrator output will be at substantially the same level as the second input signal, the first input signal thereafter acting through the integrator, the output of which is at a level equal to the second input at the time of switching.

4,458,190

ELECTRIC DISCHARGE MACHINING CONTROL DEVICE

Tamio Takawashi; Toshimitsu Sakakibara, and Shigeo Yamada, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1982, Ser. No. 390,601

Claims priority, application Japan, Jun. 25, 1981, 56-98745

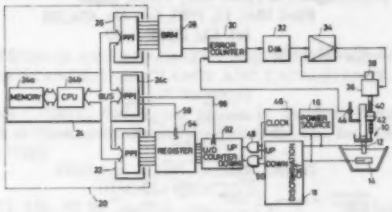
Int. Cl.³ G05B *19/28*

U.S. Cl. 318—603 **8 Claims**

1. In a control device for an electric discharge machine in which a machining electrode confronts a workpiece to be machined, and wherein a number of pulse voltages are applied across a gap therebetween so that electric discharge takes place between said electrode and workpiece, to thereby machine said workpiece, the improvement comprising;

a discrimination circuit connected between said electrode and workpiece, for detecting electric discharge conditions in said gap between said electrode and workpiece for every said pulse voltage, to output a servo signal for increasing or decreasing said gap;

an up-down counter for integrating said servo signal from said discrimination circuit for a predetermined period of time; and



a position control servo device for controlling said gap to a suitable value according to an output of said up-down counter.

4,458,191

STEP MOTOR DRIVE CIRCUIT

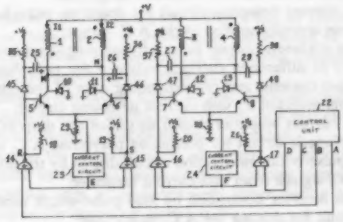
Carlo Fare, Limito, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed Jun. 14, 1982, Ser. No. 388,335

Claims priority, application Italy, Jun. 23, 1981, 22502 A/81

Int. Cl.³ H02K *29/02*

U.S. Cl. 318—696 **3 Claims**



1. A drive circuit for energizing a step motor having at least one pair of selectively energizable magnetically coupled phase windings, each winding having first and second ends, said drive circuit comprising:

a DC voltage source connected to said first end of each phase winding of said pair for supplying an energizing current thereto;

a plurality of semiconductor switching devices, each switching device having a control input and being connected in series with a different one of said phase windings of said pair;

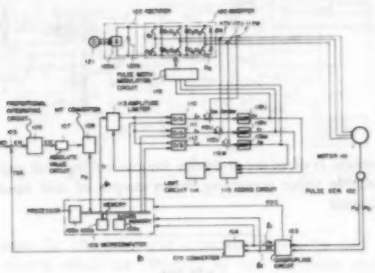
current chopping control means coupled to each of said control inputs for applying control signals thereto, each control signal enabling an energizing current to flow intermittently in a corresponding one of said switching devices and in said series connected phase winding associated therewith; and

circuit means coupled to said control input of one of said switching devices connected in series with one of said pair of phase windings and to said second end of the other phase winding of said magnetically coupled pair, said circuit means being operative to apply to said control input, a voltage pulse appearing at said second end of said other phase winding when said one of said switching devices is conditioned to switch from a conductive state to a non-conductive state, said voltage pulse applied to said control input speeding up the response time of said one of said switching devices.

4,458,192
A.C. MOTOR DRIVE APPARATUS

Keiji Sakamoto, Hachioji, and Shinji Seki, Tokyo, both of Japan, assignors to Fanuc Ltd., Tokyo, Japan

Filed Mar. 11, 1983, Ser. No. 474,335
Int. Cl.³ H05P 5/40
U.S. Cl. 318—798 2 Claims



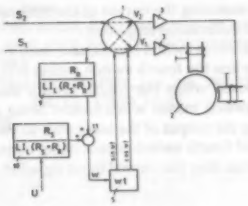
1. An apparatus for driving an A.C. motor, comprising:
(a) a circuit for producing a current command amplitude from an arithmetic difference between an externally applied speed command voltage and an actual speed voltage indicative of the actual rotational speed of the A.C. motor;
(b) a circuit for generating polyphase command currents based on the current command amplitude;
(c) a current detecting circuit for detecting polyphase currents actually applied to the A.C. motor;
(d) an arithmetic circuit for producing output signals indicative of difference currents between the polyphase command currents and corresponding ones of the phase currents detected by said current detecting circuit;
(e) a current amplifier which amplifies the outputs of said arithmetic circuit for producing polyphase A.C. signals;
(f) a pulse-width modulation circuit driven by the polyphase A.C. signals from said current amplifier;
(g) an inverter controlled by said pulse-width modulation circuit for driving the A.C. motor; and
(h) means for computing the sum of the polyphase A.C. signals and for limiting the current command amplitude when said sum is other than zero;
the current command amplitude being limited in accordance with any imbalance in the polyphase A.C. signals to maintain the polyphase currents actually applied to the A.C. motor in a balanced state.

4,458,193
METHOD AND APPARATUS FOR CONTROLLING AN AC INDUCTION MOTOR

Ragnar Jönsson, P.O. Box 48, Krageholm, Sweden (S-270 24)

PCT No. PCT/EP80/00152, § 371 Date Jul. 28, 1981, § 102(e) Date Jul. 28, 1981, PCT Pub. No. WO81/02076, PCT Pub. Date Jul. 23, 1981
PCT Filed Dec. 21, 1980, Ser. No. 287,759
Claims priority, application Sweden, Jan. 8, 1980, 8000118
Int. Cl.³ H02P 5/40
U.S. Cl. 318—803 2 Claims

1. A method for controlling an AC induction motor comprising a stator, a rotor and at least two phase windings within its entire speed range down to and including zero speed in both directions and at all loads, in response to two control signals (S_1, S_2), a first of which (S_1) essentially controls rotational speed and torque, and a second of which (S_2) essentially controls the magnetic field of the motor, the control signals being fed to a resolver (1) having an oscillator (5) connected thereto, output signals (V_1, V_2) of the resolver being used for generating individual supply signals to each motor phase winding, and a measured signal (U) representing the rotational speed of the motor, being fed back to the control system, in which the improvement comprises:
(a) scaling the measured signal (U) representing the rotational speed of the motor to a value corresponding to the electromotive voltage of the motor,



(b) feeding the control signals (S_1, S_2) directly to the resolver,
(c) and controlling the frequency of the oscillator (5) in response to the first control signal (S_1) and the scaled value of the signal (U) according to the formula:

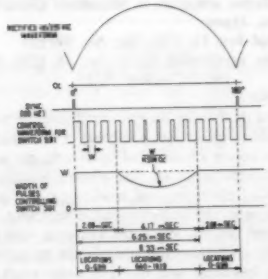
$$w = S_1 \times \frac{R_R}{LI_L(R_S + R_R)} + U \times \frac{R_S}{LI_L(R_S + R_R)}$$

where:
R_S = resistance of the stator winding
R_R = resistance of the rotor winding
L = inductance of the stator winding
I_L = the magnetizing current of the stator winding
U = the stator transformed counter-electromotive voltage of the rotor winding
S_1 = the first control signal
w = frequency of the oscillator
whereby the angular frequency (w) of the oscillator will increase with increase in the first control signal (S_1) and at increasing motor speed and decrease with increase in motor load, and the stator magnetic field at all motor speeds and all motor loads automatically is retained at constant amplitude.

4,458,194
METHOD AND APPARATUS FOR PULSE WIDTH MODULATION CONTROL OF AN AC INDUCTION MOTOR

Steven Geppert, Bloomfield Hills, and James M. Slicker, Union Lake, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 4, 1981, Ser. No. 318,087
Int. Cl.³ H02P 5/40
U.S. Cl. 318—811 5 Claims



1. A method of generating m pulse width modulated wave-

forms, each having an average voltage which varies sinusoidally at a first frequency and being applied to a respective phase input of an m-phase AC induction machine, comprising the steps of:

generating a carrier waveform which is square wave pulse train at a second frequency which is 3N times said first frequency, N being an integer and the pulses of said carrier waveform being of equal width;

selecting a reference point on said carrier waveform and evaluating the function sin θ at the center of each pulse of said carrier waveform, where θ is the angular displacement of said pulse center from said reference point at said first frequency;

modulating the width of each said pulse by moving the leading and trailing edges thereof through equal angular displacements in opposite directions, each edge of each said pulse being moved an angular distance proportional to Ksin θ, where sin θ is the value determined for such pulse according to the preceding step and K is a predetermined value, the leading and trailing edges of each pulse being moved away from each other when sin θ is positive and toward each other when sin θ is negative;

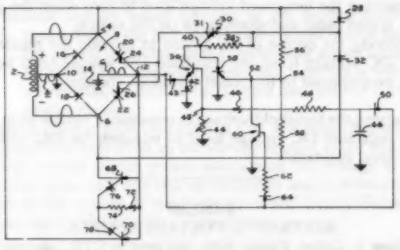
applying to one said input of said AC induction machine said modulated carrier waveform and applying to the remaining said inputs of said AC induction machine respective waveforms which are identical to said modulated carrier waveform but are shifted in phase with respect thereto by respective angular displacements at said first frequency which are successive integer multiples of 360°/m.

4,458,195

ELECTRONIC REGULATOR FOR ALTERNATOR BATTERY CHARGING SYSTEM

Michael J. Piteo, Enfield, Conn., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Mar. 2, 1982, Ser. No. 354,024
Int. Cl.³ H02J 7/14
U.S. Cl. 322—94 **5 Claims**



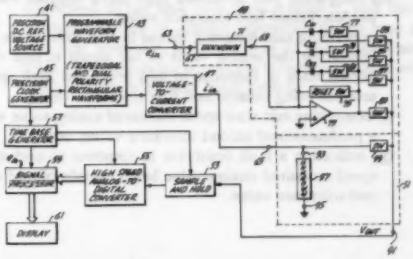
1. In a regulator rectifier for a permanent magnet alternator having a full wave rectifier bridge including a gate controlled rectifier connected in each of the branches of the rectifier from the input terminals to one of the output terminals thereof, a battery connected across the output terminals of said rectifier, the improvement comprising means for sensing the voltage level of said battery, including a voltage breakdown diode, a silicon controlled rectifier (SCR), including anode, cathode and gate electrodes, the anode of said SCR being connected to the input terminals of said rectifier and its cathode being connected with the gate electrodes of both said gate controlled rectifiers in the bridge circuit, the gate of said SCR also being connected to said input terminals to turn the SCR "on", a transistor having a collector-emitter path and base electrode, the collector-emitter path of said transistor being connected to the gate of said SCR, the base of said transistor being connected to said voltage sensing means, said transistor being rendered "conductive" by conducting current out of the SCR when the voltage level of the battery exceeds the breakdown voltage of said diode, whereby said SCR is switched to a nonconductive state when the battery exceeds a predetermined voltage.

4,458,196

METHOD AND APPARATUS FOR HIGH SPEED RESISTANCE, INDUCTANCE AND CAPACITANCE MEASUREMENT

Ramesh C. Goyal, Bothell, and Thomas H. Turnbull, Everett, both of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Aug. 5, 1981, Ser. No. 290,247
Int. Cl.³ G01R 27/00
U.S. Cl. 324—57 R **34 Claims**



1. A method of measuring the value of one or more of the resistance, inductance, or capacitance parameters of an unknown item having said parameters in a known configuration, said method comprising the steps of:

applying an excitation signal to said unknown items, said excitation signal having a waveform of a predetermined shape containing piecewise linear portions;

measuring the magnitude of an output waveform signal created by the application of said excitation signal to said unknown item at predetermined times during a single cycle of the excitation signal; and

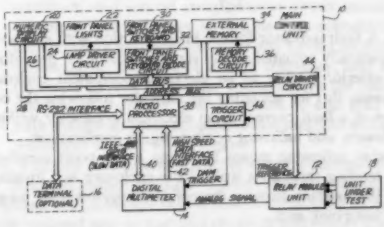
in response to said excitation signal and said measured output waveform signal, generating a signal representing the value of the parameter whose value is being measured.

4,458,197

APPARATUS AND METHOD FOR AUTOMATICALLY TESTING A MULTIPLE NODE ELECTRICAL CIRCUIT

C. Sylvester Robinson, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 8, 1981, Ser. No. 299,920
Int. Cl.³ G01R 15/12, 31/02
U.S. Cl. 324—73 AT **16 Claims**



1. Apparatus for automatically testing an electrical circuit having a plurality of test nodes, the apparatus comprising:

metering means for measuring the electrical characteristics of circuit nodes connected thereto, said metering means

being operable in a fast mode for taking high speed samples of a signal on a circuit node connected thereto, and being operable in a slow mode for measuring the analog value of a signal on a circuit node connected thereto;

switching means being actuable to connect selected circuit test nodes to said metering means;

control means coupled to said metering means and said switching means and being operable for:

(a) actuating said switching means such that a selected circuit test node is connected to said metering means;

(b) operating said metering means in said fast mode for taking high speed samples of the signal at said connected node;

(c) predeterminedly processing said high speed samples;

(d) comparing said processed high speed samples with a predetermined first tolerance value;

(e) operating said metering means in said slow mode for measuring the analog value of the signal at said connected node in response to said processed high speed samples being outside said first tolerance value;

(f) comparing said slow speed measured analog value with a predetermined second tolerance value; and

(g) indicating a fault condition in response to said slow speed measured analog value being outside of said second tolerance value.

4,458,198

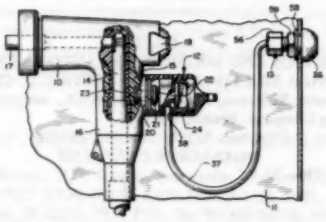
FAULT INDICATOR HAVING A REMOTE TEST POINT AT WHICH FAULT OCCURRENCE IS INDICATED BY CHANGE IN MAGNETIC STATE

Edmund O. Schweitzer, Jr., 1002 Dundee Rd., Northbrook, Ill. 60062

Continuation of Ser. No. 103,042, Dec. 13, 1979, abandoned. This application Jan. 18, 1983, Ser. No. 458,901

Int. Cl.³ G01R *19/12, 31/02*

U.S. Cl. 324—133 **46 Claims**



1. A fault indicator for use in conjunction with a removable magnetically actuated circuit status indicator for providing on the exterior surface of an electrical equipment enclosure a magnetic flux for actuating the indicator following the occurrence of a fault current in an electrical conductor within the enclosure, said indicator comprising, in combination:

status indicating means including a test point member extending through a wall of the enclosure and forming on the exterior surface thereof a tamper-resistant magnetic test point; and

fault responsive means within the enclosure responsive to the current level in the conductor for producing at said magnetic test point the magnetic flux for actuating the indicator upon the occurrence of a fault current in the conductor.

4,458,199

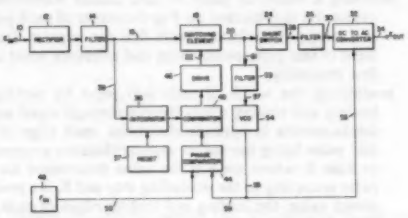
LINK REGULATOR WITH FEED FORWARD SWITCHING CONTROL

William E. Evans, and Jimmie D. Gillett, both of Garland, Tex., assignors to Varo, Inc., Garland, Tex.

Filed Feb. 4, 1982, Ser. No. 345,669

Int. Cl.³ G05F *1/46*

U.S. Cl. 323—286 **26 Claims**



1. A method for controlling a switching regulator to convert an unregulated DC voltage level to a regulated DC voltage level, comprising:

generating a pulse waveform, each pulse therein turning a series switch on to conduct current from the unregulated DC voltage level;

sensing the level of the unregulated DC voltage level on the input of the switch;

generating an integrated voltage signal that is the integral of the sensed unregulated DC voltage level with respect to time;

generating a threshold voltage;

comparing the integrated voltage level with the threshold voltage and turning the switch off when the integrated voltage level exceeds the threshold voltage such that a constant volts/seconds signal is generated on the output of the switch;

resetting the integrated voltage level to zero when the generated pulse waveform turns on the switch;

filtering the output of the switch to provide the regulated DC voltage level, the regulated DC voltage level being proportional to the preset threshold voltage; and

varying the threshold voltage in response to variations in the regulated DC voltage level to maintain the DC voltage level constant.

4,458,200

REFERENCE VOLTAGE SOURCE

William L. Geller, Tempe, Ariz., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 1, 1982, Ser. No. 438,090

Int. Cl.³ G05F *3/08, 1/46*

U.S. Cl. 323—316 **6 Claims**

1. A source of reference voltage comprising

a first series arrangement including a first transistor means, a first resistance means, a second resistance means, and a first voltage controllable current source means connected in series;

a second series arrangement including a second transistor means and a second voltage controlled current source means connected in series;

an output terminal connected between the juncture of the second resistance means and the first current source means;

balancing means for equalizing the voltage at the juncture of said first and second resistance means and the juncture of said second transistor means and said second current source means including

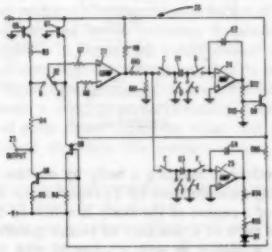
comparator means having a first input, a second input, and an output; said comparator means being operable to

produce a first output condition at the output when the voltage at the first input is greater than the voltage at the second input, and to produce a second output condition at the output when the voltage at the second input is greater than the voltage at the first input;

comparator input switching means for alternately connecting the first input of the comparator means to the juncture of the second transistor means and second current source means and the juncture of the first and second resistance means;

first sampling means for sampling the output of the comparator means when the first input of the comparator means is connected to the juncture of the second transistor means and second current source means;

first storage means coupled to the first sampling means and to the second input of the comparator means for storing the output of the comparator means sampled by the first sampling means and applying a voltage repre-



sentative thereof to the second input of the comparator means;

second sampling means for sampling the output of the comparator means when the first input of the comparator means is connected to the juncture of the first and second resistance means; and

second storage means coupled to the second sampling means and to the first and second current source means for storing the output of the comparator means sampled by the second sampling means and applying a voltage representative thereof to the first and second current source means

whereby current flow through the first and second series arrangements is controlled by the voltage applied to the first and second current source means maintaining the voltage at the juncture of the first and second resistance means substantially equal to the voltage at the juncture of the second transistor means and second current source means.

4,458,201

DIGITALLY CONTROLLED PRECISION CURRENT SOURCE WITH AN OPEN LOOP COMPENSATION CIRCUIT

Myron J. Koen, Tucson, Ariz., assignor to Burr-Brown Research Corp., Tucson, Ariz.

Filed Apr. 5, 1982, Ser. No. 365,194

Int. Cl.³ G05F *3/20, 1/58*

U.S. Cl. 323—317 **7 Claims**

1. A digitally controlled temperature compensated current source for generating a precision output current steerable through either a first or a second current path in response to a digital input signal, comprising:

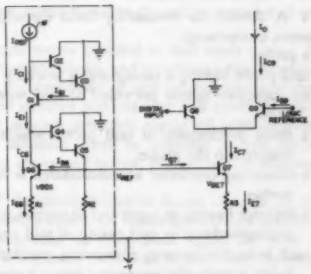
a. current source means for generating a substantially constant output current and including a current source transistor and a first resistor connected between the emitter of said current source transistor and a voltage source conductor;

b. current steering means coupled to said current source means for steering said output current through either the first or the second current paths in response to the digital input signal and including a switching transistor having an emitter coupled to the collector of said current source transistor and a collector coupled to said current path; and

c. compensation means coupled to said current source means and including:

i. reference circuit means for generating a steady state precision reference current;

ii. first compensation circuit means including a first transistor having a collector coupled to receive the reference current for generating a first compensated output current to correct for the beta error of said switching transistor, said first compensation circuit means including a second transistor having its base connected to the collector of said first transistor, and having its emitter connected to the base of a third transistor, said third transistor having its emitter connected to the base of said first transistor, the collectors of said second and third transistors being connected to bias said second and third transistors in their linear regions;



iii. second compensation circuit means including a fourth transistor having a collector coupled to receive the first compensated output current, a base coupled to the base of said current source transistor, and an emitter coupled to said voltage source for correcting for the beta error and base to emitter voltage error of said current source transistor, said second compensation circuit means including a fifth transistor having its base connected to the emitter of said first transistor and having its emitter connected to the base of a sixth transistor, said sixth transistor having its emitter connected to the base of said fourth transistor, the collectors of said fifth and sixth transistors being coupled to bias said fifth and sixth transistors in their linear regions;

iv. a second resistor connected between the emitter of said fourth transistor and said voltage source conductor; and

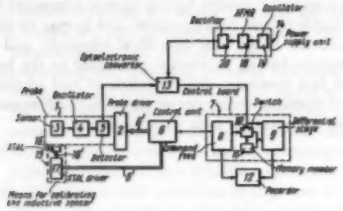
said second compensation circuit means functioning to maintain the beta and base to emitter voltage of said fourth transistor equal, respectively, to the beta and base to emitter voltage of said current source transistor, said first compensation circuit means functioning to maintain the beta of said switching transistor equal to the beta of said first transistor.

4,458,202

DEVICE FOR MEASURING LOCAL ELECTRIC CONDUCTIVITY OF LOW-TEMPERATURE PLASMA

Anatoly P. Nefedov; Felix M. Oberman; Jury G. Katoshin; Semen I. Krugly; Gennady P. Maljuzhonok, and Jury S. Mikhailov, all of Moscow, U.S.S.R., assignors to Institut Vysokikh Temperatur Akademii Nauk SSSR, Moscow, U.S.S.R.

Filed Sep. 17, 1981, Ser. No. 303,187
Int. Cl.³ G01N 27/74; G01R 33/12
U.S. Cl. 324—204 10 Claims



1. A device for measuring local electric conductivity of plasma, comprising:

a probe;

said probe having a casing and a working end;

an inductive sensor provided at said working end of said probe;

a drive mechanism of said probe which is kinematically coupled to the probe;

a measuring oscillator accommodated in said casing of said probe;

a detector having an input and an output, said detector being accommodated in said casing of said probe;

said inductive sensor, measuring oscillator, and detector being electrically connected into a series circuit;

an optoelectronic converter having two inputs and an output;

a power supply unit of said optoelectronic converter coupled to one of said inputs of said optoelectronic converter;

a differential stage having two inputs and an output;

a switch having three inputs and an output;

a memory member coupled to one of said inputs of said switch;

the output of said optoelectronic converter being coupled to an input of said switch and an input of said differential stage;

a second input of said optoelectronic converter being coupled to said output of said detector;

the second input of said inputs of said differential stage being coupled to said inputs of said switch and memory member;

a calibrating means for calibrating said inductive sensor;

an electropneumatic control unit kinematically coupled to said drive mechanism of said probe and to said means for calibrating the inductive sensor;

a unit for feeding commands for performing measurement and calibration;

said unit for feeding commands having outputs;

a unit for measurement recording having inputs;

said outputs of said unit for feeding commands being coupled to the input of said electropneumatic control unit, to one of said inputs of said measurement recording unit, and to said third input of said switch, respectively;

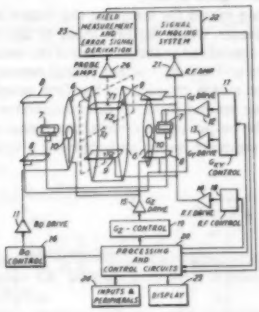
said output of said differential stage being coupled to the other of said inputs of said measurement recording unit.

4,458,203

NUCLEAR MAGNETIC RESONANCE IMAGING

Ian R. Young, Middlesex, England, assignor to Picker International Limited, Middlesex, England

Filed Dec. 1, 1981, Ser. No. 326,361
Claims priority, application United Kingdom, Dec. 11, 1980, 8039702
Int. Cl.³ G01R 33/08
U.S. Cl. 324—309 5 Claims



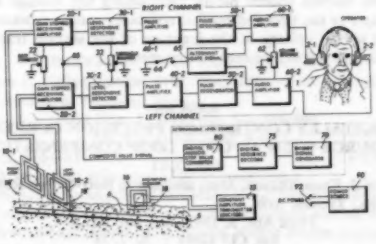
1. A method of imaging a body by nuclear magnetic resonance using data obtained by T_1 experiments wherein volume scanning of a region of the body is achieved by scanning for T_1 data in each of a plurality of planar parallel slices of said region by applying in turn a series of $\pi/2$ radio frequency pulses, each with magnetic field gradients for selecting a different one of said slices, between successive ones of a sequence of π radio frequency pulses, the scan of at least one slice occurring in the relaxation time for the scan of at least one other slice.

4,458,204

FREQUENCY DEPENDENT PULSED GAIN MODULATED CONCEALED STRUCTURE LOCATOR

Harold J. Weber, P.O. Box 214, 20 Whitney Dr., Sherborn, Mass. 01770

Filed Sep. 10, 1981, Ser. No. 300,696
Int. Cl.³ G01V 3/11, 3/165
U.S. Cl. 324—326 16 Claims



1. Translator apparatus adapted to provide a pulse train therefrom having a pulse repetition rate frequency which is derived from the average, albeit varying, amplitude of a higher frequency a.c. signal coupled thereto; comprising:

a. a portable source of about constant level, essentially continuous wave first frequency a.c. signal;

b. portable receptor means effective to separably couple with said source, usually with various levels of efficaciousness therebetween, producing therefrom a received a.c. signal proportional to the first frequency a.c. signal level modified by the coupling effacicity;

c. digital sequence signal source means effective for producing several series of pulse train signals having different intrinsic periodicity rates therebetween while having harmonic relationship thereamongst;

d. digital-to-analog stepped signal converter means coupled with said sequence signal source, effective to receive pulse train signals therefrom and produce a composite signal comprising a repetitious continuum of various amplitude value steps, each constituent step of which has a predetermined amplitude value proportional to the signal pulse series comprising the lowest frequency pulse train instantly produced by said sequence signal source;

e. receiver means coupled with said receptor means provided with an effective signal level control input thereto coupled with said composite signal, and a converted output therefrom; operative to combine, as by modulation, said received a.c. signal with said composite signal so as to produce a repetitive sequence comprising bursts of converted received signals having various values of predetermined amplitude; and further including threshold detector means responsive to the instant values of said converted received a.c. signals to repetitively produce at least a first level pulse signal therefrom when said converted received signal exceeds a predetermined threshold value, and a second level pulse signal therefrom when said converted received signal shortfalls the predetermined threshold value;

f. indicant means coupled to said pulse signal produced by said threshold detector means; and,

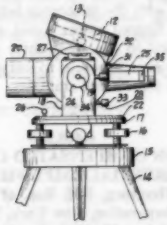
g. electric power source means effective to provide operating voltage and current to each of the thereto coupled functional elements comprising the said translator.

4,458,205

GEOMAGNETIC PROSPECTING METHOD WITH MEASUREMENTS OBTAINED DURING AN INTERNAL OF ONE TO TEN MINUTES TIME DURATION

Donald L. Hings, 281 N. Howard Ave., Burnaby, B. C., Canada (V5B 1J4)

Filed Oct. 24, 1980, Ser. No. 200,569
Int. Cl.³ G01V *3/00*
U.S. Cl. 324—345 **23 Claims**



1. A prospecting method using magnetic field angle measuring means to determine the presence of hydrocarbon-bearing substrata comprising the steps of:

establishing angle measuring means at a station site to determine the inclination and declination angles of the magnetic field of the earth,

adjusting said angle measuring means to a condition of high sensitivity to changes of the magnetic field of the earth,

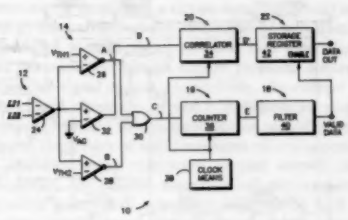
measuring said inclination and declination angles, during a first time interval in the order of one to ten minutes' duration without moving the angle measuring means from the station site, and indicating in digital form the vlaues of said inclination and declination angles and observing changes therein.

4,458,206

CIRCUIT FOR SYNCHRONIZING THE DEMODULATION OF PHASE MODULATED TRANSMISSION BURSTS

Brian W. Dellande, Austin, and Henry Wurzburg, Round Rock, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 21, 1981, Ser. No. 332,408
Int. Cl.³ H04L *27/22*
U.S. Cl. 329—50 **8 Claims**



1. A circuit for synchronizing the demodulation of phase modulated transmission bursts, each burst having a predetermined number of bit intervals, by demodulating an AC component of a first signal containing said bursts, comprising:

input means for receiving said first signal, and for providing a second signal proportional to the AC component of said first signal;

window detection means coupled to said input means, for receiving the second signal, and providing a first detection signal when the amplitude of said second signal exceeds predetermined positive and negative half cycle threshold levels and a second detection signal of predetermined positive and negative levels in response to said second signal varying above and below, respectively, a reference voltage;

integration and threshold detection means coupled to said window detection means, for receiving said first detection signal, for providing an integration signal the level of which is an integration over time of said first detection signal, and for providing a sync detect signal, indicative of the detection of said second signal, in response to said integration signal exceeding a predetermined synchronization threshold level;

correlation means coupled to said window detection means, for receiving said second detection signal, detecting a phase relationship between predetermined bit intervals of said second detection signal, and providing a data bit representing a demodulated output signal which is indicative of said phase relationship for each of said bit intervals;

storage means coupled to said correlation means, for receiving said data bits, and storing a predetermined number of the most recently received of said data bits; and

pulse shaping means coupled to said threshold detection means, for receiving said sync detect signal and for providing a valid data signal which is indicative of both the acquisition of synchronization and the validity of the data bits stored in said storage means.

4,458,207

FM DEMODULATOR WITH VARIABLE BANDPASS FILTER

Michel Favreau, and Andre Marguinaud, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 16, 1981, Ser. No. 302,783
Claims priority, application France, Sep. 16, 1980, 80 19921
Int. Cl.³ H03D *3/00*; H04B *1/10*
U.S. Cl. 329—136 **5 Claims**

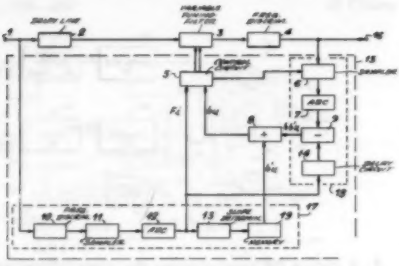
1. A demodulator for a frequency-modulated signal, comprising:

a bandpass filter having a first control input for adjusting its

center frequency, a second control input for adjusting the width of its passband, a third input for receiving the modulated signal, and one output;

a frequency discriminator having one input connected to the output of the filter and one output constituting the demodulator output for delivering the modulation signal;

a control system comprising computation means for computing a value F_i of the instantaneous frequency of the modulated signal and for computing, as a function of the rate of



variation of the modulation signal, a value b_u of the instantaneous width of the frequency band occupied by the modulated signal, said control means being provided with a first output connected to the first control input of the filter for delivering a signal which is a function of F_i to said filter in order to adjust the center frequency to the value F_b and a second output connected to the second control input of the filter for delivering a signal which is a function of b_u to said filter in order to adjust the bandwidth to the value b_p.

4,458,208

PULSE WIDTH MODULATED SIGNAL AMPLIFIER

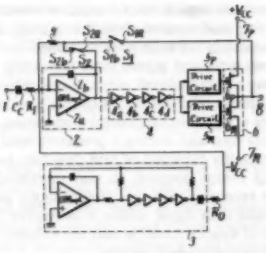
Miki Abe, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 9, 1982, Ser. No. 367,213

Claims priority, application Japan, Apr. 10, 1981, 56-54680

Int. Cl.³ H03F *3/16*

U.S. Cl. 330—10 **14 Claims**



1. A pulse width modulated signal amplifier comprising: a power source for supplying a DC voltage; an input terminal for receiving an input signal to be pulse width modulated; an integrator having input and output terminals; a carrier signal oscillator for supplying a carrier signal; circuit means for supplying said input signal and said carrier signal to the input terminal of said integrator; a comparator having input and output terminals with the input terminal connected to the output terminal of said integrator and the output terminal producing a pulse width modulated signal; an output amplifier supplied with a DC voltage from said power source and having input and output terminals, the input terminal connected to the output terminal of said comparator and the output terminal producing an amplified pulse width modulated signal; and a negative feedback circuit connected between the input terminal of said integrator and the output terminal of said output amplifier and including a series connection of a feedback impedance and a first switching means, the first switching means being conductive after a predetermined time from the time when the DC voltage from said power source is supplied to said output amplifier so as to prevent oscillations.

4,458,209

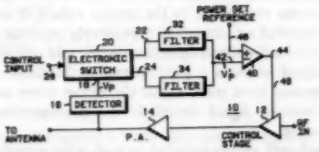
ADAPTIVE POWER CONTROL CIRCUIT

Gene D. Miller, Arlington Heights; James E. Mitzlaff, Carpentersville, and Peter A. Kwitkowski, Elgin, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 3, 1981, Ser. No. 230,965

Int. Cl.³ H03G *3/30*

U.S. Cl. 330—141 **11 Claims**



1. A power control circuit for controlling the power of a transmitter amplifier which produces an RF output varying in response to a control signal applied thereto, comprising:

(a) sensing means, coupled to the transmitter amplifier, for sensing RF power, and for generating a power signal representative of RF power;

(b) signal processing means, coupled to the sensing means, for filtering the power signal, such that wide bandwidth filtering is utilized in response to a desired change in transmitter amplifier power for a period of time sufficient to permit the desired change in transmitter amplifier power, and such that narrow bandwidth filtering is otherwise utilized;

(c) comparator means, coupled to the signal processing means, for generating a control signal which varies in accordance with the difference between a reference voltage and the filtered power signal, said comparator means being coupled to the transmitter amplifier for applying said control signal thereto to vary the RF power developed by the transmitter amplifier.

4,458,210

DISTORTION COMPENSATED CROSS-COUPLED DIFFERENTIAL AMPLIFIER CIRCUIT

Manfred Horl, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 23, 1981, Ser. No. 276,597

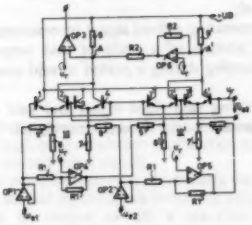
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024142

Int. Cl.³ H03G *3/30*

U.S. Cl. 330—254 **8 Claims**

1. A circuit arrangement comprising a first amplifier circuit including a first and a second differential amplifier with the first differential amplifier comprising first and second transistors with interconnected emitters and the second differential amplifier comprising third and fourth transistors with interconnected emitters, means coupling an output of the first amplifier circuit to a collector of one transistor of each of the first and second differential amplifiers, a source of control voltage coupled between the base electrodes of the first and second transistors, means connecting the base electrode of the third transistor to the base electrode of the second transistor and the base electrode of the fourth transistor to the base electrode of

the first transistor, a second identical amplifier circuit comprising a third and a fourth differential amplifier with the third differential amplifier comprising fifth and sixth transistors with interconnected emitters and the fourth differential amplifier comprising seventh and eighth transistors with interconnected emitters, means coupling an output of the second amplifier circuit to a collector of one transistor of each of the third and fourth differential amplifiers, means coupling the base electrode of the sixth transistor to the base electrode of the seventh transistor and to the base electrode of the second transistor and the base electrode of the eighth transistor to the base electrode of the fifth transistor and to the base electrode of the first



transistor, means including first and second inverter circuits for applying the same quiescent currents to the emitter branches of the third and fourth differential amplifiers, respectively, means for applying an input signal to the emitter branches of the first and second differential amplifiers, means for applying said input signal to the emitter branches of the third and fourth differential amplifiers in phase opposition to the input signal at the emitter branches of the first and second differential amplifiers, respectively, and a subtractor circuit coupled to said outputs of the first and second amplifier circuits so as to form the difference of the signal components at said outputs of the first and second amplifier circuits to derive an output signal of the circuit arrangement.

4,458,211

INTEGRABLE SIGNAL-PROCESSING SEMICONDUCTOR CIRCUIT

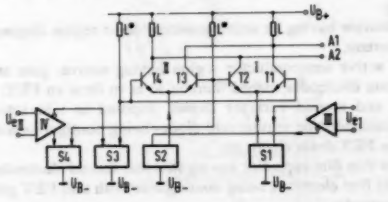
Hans Kriedt, Munich, and Andreas Dietze, Valley, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 1, 1982, Ser. No. 413,772

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1981, 3134936

Int. Cl.³ H03F 3/45

U.S. Cl. 330—257 **11 Claims**



1. Integrable signal-processing semiconductor circuit, comprising four identical transistors each having current input, current output and control electrodes, said four transistors being combined into two pairs of transistors, said transistors of each pair being connected together through their current input electrodes forming first and second differential amplifiers, first and second signal outputs, the current output electrodes of one transistor of each transistor pair being connected to each other and to said first signal output and the current output electrodes of the other transistor of each transistor pair being connected to each other and to said second signal output, third and fourth differential amplifiers being addressed by respective first and second signals and each having two outputs, first and second current mirror amplifiers each being connected to a respective one of the outputs of said third differential amplifier, third and fourth current mirror amplifiers each being connected to a respective one of the outputs of said fourth differential amplifier, a circuit reference potential source connected to each of said current mirror amplifiers, a circuit supply potential source connected to the current output electrodes of said transistors being connected to said signal outputs, two load elements connected between said circuit supply potential source and first and second signal output, respectively, the current input electrodes of said transistors of said first differential amplifier being connected to said first current mirror amplifier and the current input electrodes of said transistors of said second differential amplifier being connected to said second current mirror amplifier, the control electrodes of one transistor of each transistor pair being connected together to said third current mirror amplifier and through one of said load elements to said circuit supply potential source, and the control electrodes of the other transistor of each transistor pair being connected together to said fourth current mirror amplifier and through the other of said load elements to said circuit supply potential source.

4,458,212

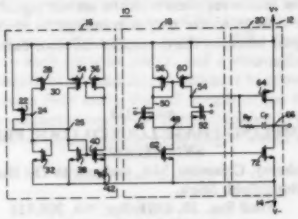
COMPENSATED AMPLIFIER HAVING POLE ZERO TRACKING

Kevin E. Brehmer, Sunnyvale, Calif., and John A. Fisher, Addison, Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Dec. 30, 1981, Ser. No. 335,628

Int. Cl.³ H03F 3/45

U.S. Cl. 330—260 **18 Claims**



1. A circuit for producing a compensated output signal comprising:

first amplifying means having an input and an output;

second amplifying means having an input and an output, the input of said second amplifying means connected to the output of said first amplifying means;

passive feedback means comprising a first resistive element connected between the input and the output of said second amplifying means for determining the frequency response of the combination of said first and second amplifying means, said passive feedback means varying the frequency response in response to manufacturing process variations;

compensating means for varying the frequency response of said first and second amplifying means in response to manufacturing process variations, said compensating means comprising a second resistive element; and

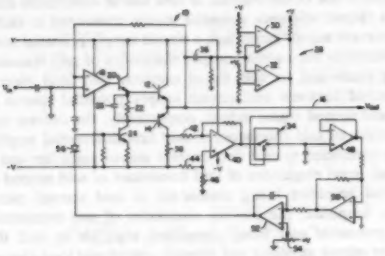
said passive feedback means and said compensating means manufactured in a common process wherein said compensating means counteracts frequency response variations of said first and second amplifying means resulting from said passive feedback means.

4,458,213

CONSTANT QUIESCENT CURRENT, CLASS AB AMPLIFIER OUTPUT STAGE

Ronald Quan, Cupertino, Calif., assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,133
Int. Cl.³ H03F *3/30*
U.S. Cl. 330—267 **3 Claims**



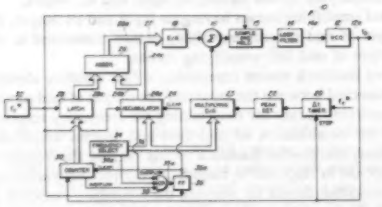
1. In combination with a transistor amplifier for receiving an input signal and producing a corresponding, amplified, output signal and having at least one output transistor, means for controlling the quiescent collector current of the output transistor, comprising differential amplifier means for sensing the output transistor's collector current and for producing a first signal proportional thereto, zero-crossing detector means supplied with the output signal, a sample and hold means supplied with the first signal and controlled by the zero-crossing detector means to sample and hold the first signal whenever the output signal is at zero voltage, means for supplying a reference signal, inverter/integrator means for inverting the sampled and held first signal and for producing a second signal which is representative of the integrated difference between the sampled and held first signal and the reference signal, and bias control means supplied with the second signal for supplying a bias voltage to the output transistor in response to the second signal whereby the quiescent collector current is maintained constant.

4,458,214

FAST SAMPLING PHASE LOCKED LOOP FREQUENCY SYNTHESIZER

Paul E. Lakomy, Columbia, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 28, 1981, Ser. No. 305,816
Int. Cl.³ H03L *7/18*
U.S. Cl. 331—1 A **8 Claims**



1. A phase locked loop frequency synthesizer comprising:

oscillator means responsive to a refined error signal for generating an output frequency signal Nf_r, where N is a positive integer and f_r is a reference frequency;

a source of a sampling signal Kf_r where K is a positive integer;

means for generating a first signal representing the number of whole cycles of said output frequency signal generated since a reference time zero;

means responsive to said sampling signal for sampling said first signal at the Kf_r rate;

means responsive to said sampling signal for generating a second signal representing a number which is incremented by N stepwise at said Kf_r rate;

means for dividing said second signal by K to obtain a first part representing whole cycles of a computed frequency signal and a second part representing a computed fractional part of a cycle of said computed frequency signal;

means combining the sampled first signal with said first and second parts of said second signal to generate a coarse error signal;

means for generating a third signal representing a measured fractional portion of a cycle of said output frequency signal occurring during a period of said sampling signal; and,

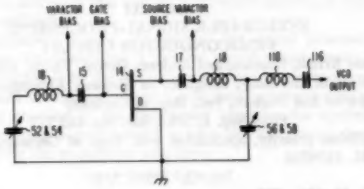
means combining said third signal and said coarse error signal to generate said refined error signal.

4,458,215

MONOLITHIC VOLTAGE CONTROLLED OSCILLATOR

Ho-Chung Huang, Princeton Junction, and Daniel D. Mawhinney, Livingston, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,153
Int. Cl.³ H01L *27/04*; H03B *5/00*
U.S. Cl. 331—117 D **9 Claims**



1. A monolithic voltage controlled oscillator device, comprising:

a substrate having an active semiconductor region disposed thereon;

said active semiconductor region having source, gate and drain electrodes spaced thereon so as to form an FET;

first and second varactor diodes disposed in said active semiconductor region, said diodes being contiguous with the FET drain electrode;

a first thin film capactior having first and second electrodes, said first electrode being continguous with said FET gate electrode;

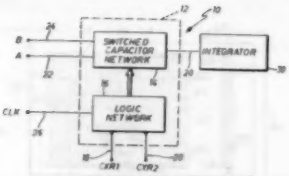
a second thin film capacitor having first and second electrodes, said first electrode being contiguous with said FET source electrode; and

interconnection means between said first diode and said second electrode of said first capacitor and between said second diode and said second electrode of said second capacitor, such that relatively few noncontiguous interconnection means are utilized.

4,458,216
SWITCHED-CAPACITOR MODULATOR FOR QUADRATURE MODULATION

John A. C. Bingham, Palo Alto, Calif., assignor to Racal-Vadic, Inc., Milpitas, Calif.

Filed Sep. 22, 1981, Ser. No. 304,690
Int. Cl.³ H03C 1/02; H03K 7/00
U.S. Cl. 332—9 R 10 Claims

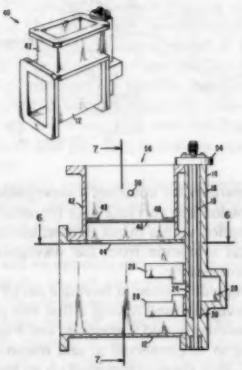


1. A switched-capacitor modulator for use in a communication system employing amplitude modulation comprising:
a first and second input signal;
a switched-capacitor network electrically connected to said first and second input signals including a plurality of input switches, an output switch, a plurality of grounding switches, an output switch, a plurality of grounding switches, and a common capcitor electrically connected between said input and output switches; and,
a logic circuit adapted to receive first and second carrier signals and a clocking signal, each of said first and second carrier signals having the same frequency but having a ninety-degree phase difference between them, said logic circuit controlling said plurality of input switches so as to modulate each of said carrier signals by one of said first and second input signals by alternately connecting said first and second input signals to said common capacitor, and by changing the phase of said clocking signal under control of the carrier signals to control the closing of said input switches.

4,458,217
SLOT-COUPLED MICROWAVE DIPLEXER AND COUPLER THEREFOR

Mon N. Wong, Torrance, and Frank A. Taormina, Glendale, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Oct. 5, 1981, Ser. No. 308,307
Int. Cl.³ H01P 1/213, 5/103
U.S. Cl. 333—135 10 Claims

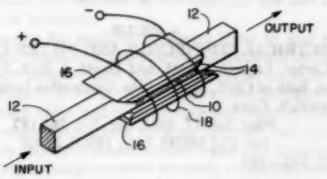


1. A microwave power coupler comprising:
a first waveguide means for propagating microwave power in a generally longitudinal direction, said first waveguide having parallel narrower walls and parallel wider walls;
an endwall serving as a short circuit for said first waveguide means, said endwall being located at one longitudinal end of said first waveguide means, said endwall having an elongated slot extending parallel to said narrower walls; and
a coaxial transmission line extending adjacent said endwall, said coaxial transmission line including a resonator section in communication with said first waveguide through said slot.

4,458,218
DIELECTRIC WAVEGUIDE RECIPROCAL FERRITE PHASE SHIFTER

Richard W. Babbitt, Fair Haven, and Richard A. Stern, Allenwood, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 14, 1982, Ser. No. 387,986
Int. Cl.³ H01P 1/19
U.S. Cl. 333—158 15 Claims

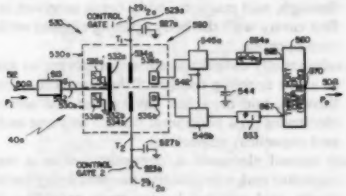


1. A ferrite phase shifter for use in a dielectric waveguide transmission line, said ferrite phase shifter comprising a length of ferrite material of the same cross-sectional dimension as that of the dielectric waveguide and said ferrite material being so positioned as to become a section of the transmission line, a thin plastic layer on the top and bottom of the ferrite and a metal plate on each piece of plastic, and a wire coil wrapped around the length of this multilayer structure to provide a d.c. magnetic biasing field along the axil length of the ferrite for enabling the magnetization of the ferrite resulting in a reciprocal phase shift or change in electrical length within the structure.

4,458,219
VARIABLE PHASE SHIFTER

James L. Vorhaus, Newton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Mar. 1, 1982, Ser. No. 353,116
Int. Cl.³ H01P 1/18
U.S. Cl. 333—164 7 Claims



1. A phase shifter comprising:
a pair of phase shifter stages, each stage having an input port and an output port comprising:
(i) a pair of transistors, each transistor having a pair of con-

trol electrodes and an output electrode, with a first one of the control electrodes of each transistor being fed a control signal and a second one of the control electrodes of each transistor being fed an input signal;

(ii) means, coupled to the output electrode of each transistor, for providing a pair of signal paths between the output electrodes of each transistor and the output port of such stage, such signal paths having an electrical pathlength difference of 90°;

a third phase shift stage having an input port and output port comprising:

(i) a pair of transistors, each transistor having a pair of control electrodes and an output electrode, with a first one of the control electrodes of each transistor being fed a control signal and a second one of the control electrodes of each transistor being fed an input signal;

(ii) means, coupled to the output electrode of each transistor, for providing a pair of signal paths between the output electrodes of each transistor and the output port of such stage, such signal paths having an electrical pathlength difference of 180°; and

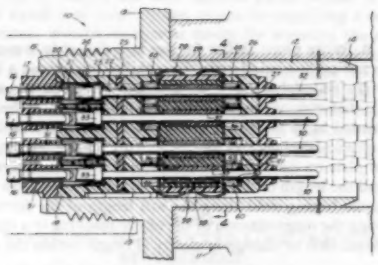
wherein the pair of phase shifter stages and the third phase shifter stage are cascade interconnected.

4,458,220

ELECTRICAL CONNECTOR AND FILTER CIRCUIT

Paul Carter, Laguna Niguel, and David J. Ball, Pacific Palisades, both of Calif., assignors to Automation Industries, Inc., Greenwich, Conn.

Filed Jul. 17, 1981, Ser. No. 284,187
Int. Cl.³ H03H *7/01;* H01R *23/08*
U.S. Cl. 333—182 **8 Claims**



1. A filter package adapted for use with a plug and receptacle connector in which a pin contact is releasably mated with a socket contact, comprising:

enclosure means having an opening extending therethrough for receiving a connector contact and including first and second enlarged spaced apart cavities located along said opening and in open communication with said opening;

a body of magnetic material having an opening of a size enabling fitting receipt of the connector contact therethrough, said magnetic body being received in the means first cavity with the body opening aligned with the enclosure opening;

a substantially cylindrical capacitor having an axial opening of a size enabling receipt of the connector contact therethrough, said capacitor having first and second terminal electrodes on a peripheral surface and one end surface of said capacitor, respectively;

said second electrode is deposited within a recess in the capacitor end, a conductive member being received in said recess, said member having parts extending beyond the capacitor end, and a conductive disc clampingly received onto the conductive member parts and contacting the connector contact; and

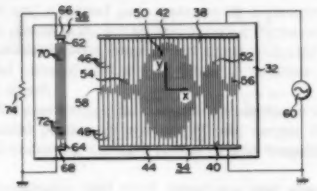
spring contact means carried by said enclosure means contacting one of said capacitor terminal electrodes.

4,458,221

SURFACE ACOUSTIC WAVE FILTER

Hitoshi Suzuki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 18, 1982, Ser. No. 409,040
Claims priority, application Japan, Sep. 11, 1981, 56-142484
Int. Cl.³ H03H *9/64, 9/145*
U.S. Cl. 333—196 **11 Claims**



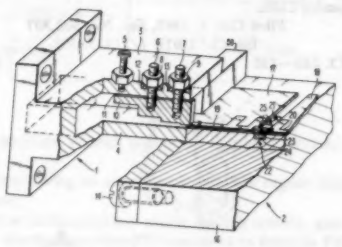
1. In a surface acoustic wave filter comprising an apodized transducer spaced from a second transducer on a piezoelectric substrate, said apodized transducer comprising comb-like electrodes interdigitally overlapped to form an envelope having a main lobe and at least one pair of corresponding side lobes on opposite sides of said main lobe, the improvement comprising said side lobes in each pair of corresponding side lobes being of unequal height, said side lobe of each pair of corresponding side lobes nearer said second transducer having a height sufficiently smaller than the height of the other of said corresponding side lobes so that said filter has a substantially symmetrical impulse response.

4,458,222

WAVEGUIDE TO MICROSTRIP COUPLER WHEREIN MICROSTRIP CARRIES D.C. BIASED COMPONENT

Dov Herstein, Princeton, and Leonard S. Rosenheck, Morris Plains, both of N.J., assignors to Microwave Semiconductor Corporation, Somerset, N.J.

Filed May 6, 1981, Ser. No. 261,145
Int. Cl.³ H01P *5/107*
U.S. Cl. 333—26 **9 Claims**



1. An apparatus for coupling a waveguide to a printed circuit transmission line carrying high frequency electronic components supplied with a direct current biasing voltage requiring electrical insulation from the waveguide structure, said apparatus comprising:

(1) a waveguide connector having a cavity corresponding to said waveguide and having a first end portion adapted to be connected to said waveguide and a second end portion adapted to be connected to said transmission line;

(2) a transition element mounted on an inner surface within the cavity of said connector and extending into said connector for high frequency coupling said printed circuit transmission line thereto, said transition element further

extending through said second end portion to reach said transmission line;

(3) electrical connecting means mounted onto and extending into said connector cavity for feeding said direct current biasing voltage through said transition element to said printed circuit transmission line; and

(4) direct current insulating means for insulating said electrical connecting means and said transition element from said connector.

4,458,223

MICROWAVE WINDOW ASSEMBLY HAVING COOLING MEANS

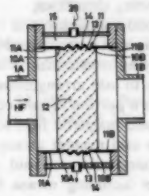
Wolfgang Schmidt, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 286,948, Jul. 27, 1981, abandoned. This application Sep. 23, 1983, Ser. No. 535,535

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1980, 3028461

Int. Cl.³ H01P *1/08*

U.S. Cl. 333—252 **9 Claims**



1. A microwave window assembly for closing openings in first and second waveguides while enabling the transmission of microwave energy from one waveguide to the other, said assembly comprising:

a. a window of microwave permeable material having first and second opposing faces adjacent the openings in the first and second waveguides, respectively, and a circumferential side extending between said faces;

b. an electrically and thermally conductive layer on the circumferential side;

c. a first electrically conductive frame member attaching the first face to the first waveguide, one end of said member framing said first face and being soldered to the conductive layer at an edge of the layer near said first face, and an opposite end of said member framing the opening in the first waveguide and being hermetically and electrically connected to the first waveguide, said first frame member cooperating with said first face to seal the opening in the first waveguide;

d. a second electrically conductive frame member attaching the second face to the second waveguide, one end of said member framing said second face and being soldered to the conductive layer at an edge of the layer near said second face, and an opposite end of said member framing the opening in the second waveguide and being hermetically and electrically connected to the second waveguide, said second frame member cooperating with said second face to seal the opening in the second waveguide; and

e. means for directing a coolant against the conductive layer; said conductive layer providing electrical continuity from one frame member to the other and facilitating heat transfer from the window to said coolant.

4,458,224

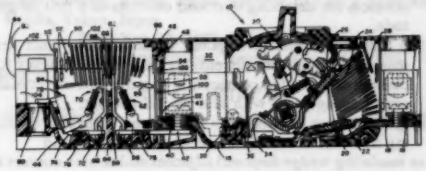
CURRENT-LIMITING CIRCUIT BREAKER ADAPTER

Andrew J. Kralik, Marysville, and Bernard DiMarco, Bellefontaine, both of Ohio, assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Apr. 20, 1982, Ser. No. 370,008

Int. Cl.³ H01H *77/10*

U.S. Cl. 335—16 **19 Claims**



1. A current-limiting electrical apparatus comprising:

a housing;

first and second electrical terminals located within said housing;

a pair of electrical contacts disposed within said housing and electrically connected in series with said first and second electrical terminals;

biasing means for applying a biasing force to said pair of electrical contacts to bias said pair of electrical contacts to a closed position, said pair of electrical contacts being configured relative to one another to electromagnetically repel each other and to overcome said biasing force and open when the current flowing through said electrical contacts exceeds a predetermined value said biasing means including a spring-powered assembly connected to at least one of said pair of electrical contacts; and

means responsive to the current flowing through said electrical contacts and connected to said biasing means for decreasing said biasing force as said current flowing in said electrical contacts approaches said predetermined value to thereby decrease said predetermined value causing said electrical contacts to immediately open, said means for decreasing said biasing force including means connected to said spring-powered assembly for changing the angle at which said biasing force is applied to said one of said electrical contacts.

4,458,225

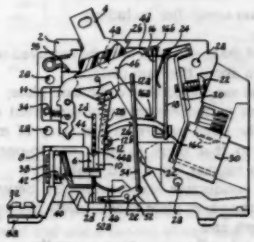
CIRCUIT BREAKER WITH INDEPENDENT MAGNETIC AND THERMAL RESPONSIVE CONTACT SEPARATION MEANS

Kenneth A. Forsell, Whitefish Bay, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 18, 1982, Ser. No. 442,707

Int. Cl.³ H01H *73/02, 73/18*

U.S. Cl. 335—35 **11 Claims**



1. An electric circuit breaker comprising, in combination:

an insulating housing;

separable contacts disposed within said housing;

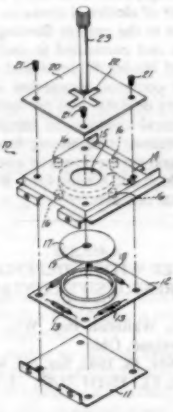
a movable contact arm pivoted at one end and carrying one of said separable contacts at its other end;
conductive support means positioning a second of said separable contacts in the path of travel of said one contact;
an operating mechanism for selectively causing said pivoted contact arm to move said one contact into and out of engagement with said second contact;
thermal means connected in circuit with said separable contacts for detecting overload currents of a first magnitude;
trip means operable in response to detection of said first magnitude overload currents by said thermal means for causing said pivoted contact arm to move said one contact out of engagement with said second contact;
magnetic means isolated from said thermal means for detecting overload currents of a second magnitude; and
an insulating wedge disposed adjacent said second contact in a first position and operable in response to detection of said second magnitude overload currents by said magnetic means for movement between said separable contacts to a second position to cam said one contact away from said second contact, thereby to interrupt current flow between said contacts.

4,458,226

NON-CONTACT DIRECTION CONTROLLER

Chih M. Cho, Taipei, Taiwan, assignor to Matahari International Corp., Taipei, Taiwan

Filed Jan. 28, 1983, Ser. No. 461,772
Int. Cl.³ H01H *36/00*
U.S. Cl. 335—205 **4 Claims**



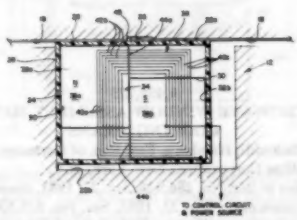
1. A direction controller including:
a base plate;
a plurality of magnetic reed switches arrayed in a symmetrical pattern about the base plate;
a cover plate supported above the base plate;
a plurality of permanent magnets supported on the cover plate in the same pattern as the array of magnetic reed switches so that there exists a one-to-one relationship between a magnet and a reed switch;
a magnetic conductive sheet supported between the base plate and the cover plate so as to allow motion in the plane of the sheet; and
an elongated handle projecting normally to the magnetic conductive sheet and having one end fixed thereto so that motion of the handle moves the magnetic conductive sheet in its plane, whereby the magnetic conductive sheet may be interposed between selected magnets and their associated reed switches to control the conductive condition of the reed switches.

4,458,227

ELECTROMAGNETIC ACTUATORS

Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 12, 1982, Ser. No. 367,361
Int. Cl.³ H01F *7/08*
U.S. Cl. 335—222 **13 Claims**



1. An electromagnetic actuator comprising:
a permanent magnet arrangement having at least one magnetic field extending therefrom;
at least one extended conductor; and
means for mounting said magnet arrangement and said conductor in overlying relationship with said one magnetic field at an angle to said arrangement and said conductor and with at least a portion of said conductor in intersecting relation to said magnetic field so as to effect relative motion between said magnet arrangement and said conductor upon energization of said conductor, and said mounting means including means for fixedly mounting one of said magnet arrangement and said conductor and for mounting the other thereof for translational movement in a plurality of directions whereby said other of said magnet arrangement and said conductor is displaced in one of said plurality of directions in accordance with said energization.

4,458,228

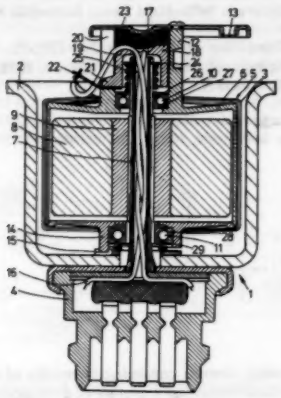
ROTARY POSITIONING APPARATUS AND ASSOCIATED METHODS, SUCH AS FOR A CARBURETOR CHOKE VALVE

Hans Baumgartner, Viersen, Fed. Rep. of Germany, assignor to Pierburg GmbH & Co. KG., Neuss, Fed. Rep. of Germany

Filed Nov. 3, 1981, Ser. No. 317,765
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040636; Apr. 7, 1981, 3113935
Int. Cl.³ H01R *39/00*; H01F *7/08*
U.S. Cl. 335—229 **28 Claims**

1. Rotary positioning apparatus for a member movable through an angle of rotation of less than 360°, said apparatus comprising a rotor including windings thereon, a stator including a permanent magnet establishing a magnetic circuit providing magnetic flux through which said rotor is movable, said rotor and stator constituting a DC motor, said stator including a stationary hollow shaft, bearing means rotatably supporting said rotor on said hollow shaft, said rotor including a neck, means on said neck for coupling the neck with the member to be moved, means for energizing said windings on the rotor for producing rotation of the rotor, the latter means comprising a plurality of flexible current carrying wires extending through said hollow shaft and through slot means provided in said neck to said windings, said hollow shaft having opposite open ends at one of which said wires enter the hollow shaft and at the

other of which said wires exit from said shaft and extend through said slot means to said windings, said wires undergoing twisting within said stationary shaft as said rotor rotates with respect to said stator.

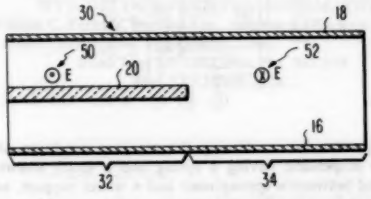


4,458,229

DISPERSION CORRECTING WAVEGUIDE

Norman R. Landry, Mount Laurel, and Leonard H. Yorinks, Cherry Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 17, 1981, Ser. No. 331,899
Int. Cl.³ H01P *5/00*
U.S. Cl. 333—248 **5 Claims**



1. A transmission system for propagation of electromagnetic waves of a given frequency range comprising:

first and second waveguide portions connected in series and having first and second lengths, respectively, each of said waveguide portions being dimensioned for fundamental mode operation over said given frequency range, each of said waveguide portions, when empty, being dispersive over said given frequency range and having a phase versus frequency characteristic over said given frequency range which deviates from linear and whose deviation from linear has a curvature of one sign;

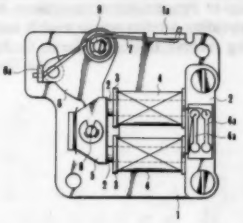
dispersion reduction means comprising an elongated dielectric member disposed within said second waveguide portion with its long dimension extending the length of said portion along the direction of propagation, said dielectric member extending parallel to the direction of the E-field of said fundamental mode electromagnetic wave, said dielectric member having a dielectric constant of a least 4 and a thickness across said E-field in combination with said second length to provide said second portion with a phase velocity versus frequency characteristic over said given frequency range whose deviation from linear has a curvature of an opposite sign to that of the phase velocity versus frequency charactertistic of said first waveguide portion over said given frequency range whereby the series connection of said first portion and said second portion has a substantially reduced dispersion as compared to the dispersion of said series connection when both waveguides are empty.

4,458,230

MAGNETIC DEVICE

Masami Shimizu, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1981, Ser. No. 322,551
Claims priority, application Japan, Nov. 26, 1980, 55-168903[U]
Int. Cl.³ H01F *7/08*
U.S. Cl. 335—271 **5 Claims**



1. A magnetic device comprising:

(a) a yoke;

(b) coils provided on the yoke and arranged to be excited by a supply of current;

(c) an armature, said armature being arranged for movement so as to be selectively attracted and separated relative to the yoke;

(d) urging means for urging the armature in the direction along which the armature is separated from the yoke; and

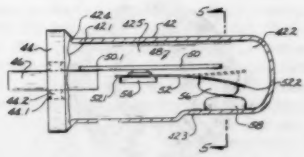
(e) a precious metal layer plated at least at one of the attraction surfaces of the yoke and the armature which surfaces confront one another when the armature is attracted to the yoke.

4,458,231

PROTECTOR APPARATUS FOR DYNAMOELECTRIC MACHINES

Ronald E. Senor, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 14, 1981, Ser. No. 330,750
Int. Cl.³ H01H *61/02*
U.S. Cl. 337—107 **8 Claims**



1. A thermostatic switch adapted to be thermally coupled to the windings of a dynamoelectric machine comprising a housing of a thermally and electrically conductive material, the housing being generally cylindrical in configuration and having a first opened end and a second closed end, and defining a switching cavity therein, a header received at and closing the first opened end, the header provided with and outer peripheral margin hermetically attached to the housing, an aperture formed in a central portion of the header and an electrically

conductive pin member extending through the aperture into the switching cavity in electrical insulative relation to the header margin, a thermostatic assembly including a thermostatic element mounted on the pin and including a movable contact mounted on the thermostatic element, a stationary contact disposed in the switching chamber supported by and in electrical connection with the housing, the movable contact adapted to move into and out of engagement with the stationary contact at predetermined temperature conditions of the thermostatic element characterized in that the cylindrical housing is generally elliptical having a major axis determined by the spacing required between the housing and a thermostatic assembly selected for use with a first range of current ratings of dynamoelectric machines the housing being useful to house a thermostatic assembly selected for use with both the first range of current ratings and a second lower range of current ratings of dynamoelectric machines, the elliptical configuration providing a reference to enable angular orientation of the housing relative to the header to facilitate assembly of the switch.

4,458,232

QUENCHING BAFFLES FOR AN ELECTRICAL OVERLOAD FUSE

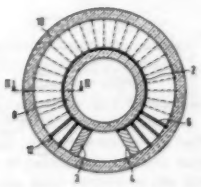
Johann Wolf, Bubenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 304,032

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1980, 3035873

Int. Cl.³ H01H *85/38*

U.S. Cl. 337—273 **12 Claims**



1. In an electrical overload fuse with a fusible conductor and quenching baffles of electrically conductive material, the improvement comprising, the fusible conductor being curved along a radius of curvature about an axis, forming a continuous curve from one end to the other and a plurality of quenching baffles disposed at least approximately perpendicular to the fusible conductor and extending radially with respect to said axis.

4,458,233

GAS SENSING ELEMENT

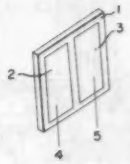
Yoshiharu Komine, and Takao Sawada, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1983, Ser. No. 475,972

Claims priority, application Japan, Mar. 30, 1982, 57-51852; Mar. 30, 1982, 57-51853

Int. Cl.³ H01L *7/00*

U.S. Cl. 338—34 **2 Claims**



1. A gas sensing element consisting essentially of a gas sensing material which comprises a mixture of a composite oxide of titanium and niobium, and a ruthenium oxide.

4,458,234

ON-BOARD APPARATUS FOR MONITORING THE CONDITION OF SHOCK ABSORBERS

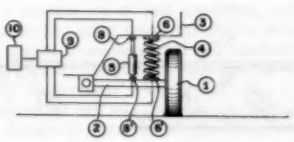
Gerard J. Brisard, 52, rue Louis-Auroux, 94120 Fontenay Sous Bois, France

Filed Jan. 18, 1982, Ser. No. 339,848

Claims priority, application France, May 14, 1981, 81 09579

Int. Cl.³ B60Q *1/00*

U.S. Cl. 340—52 R **14 Claims**



1. Apparatus for monitoring the working condition of a vehicle's suspension having a spring and a shock absorber interposed between a sprung mass and a wheel support, said apparatus comprising first detector means interposed between said mass and said spring in a position to be subjected to a force in response to relative vertical movement between said mass and said wheel support; second detector means interposed between said mass and said shock absorber in a position to be subjected to a force in response to said relative vertical movement, each of said detector means corresponding to the other and being responsive to the application of such force to generate an electrical pulse; measurement means coupled to each of said detector means for receiving and measuring the magnitude of said pulse; and indicating means coupled to said measurement means for indicating the magnitude of said pulse.

4,458,235

FOREGROUND SUBJECT-IDENTIFYING APPARATUS

Masumi Ohyama, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 25, 1981, Ser. No. 237,845

Claims priority, application Japan, Feb. 27, 1980, 55-23716

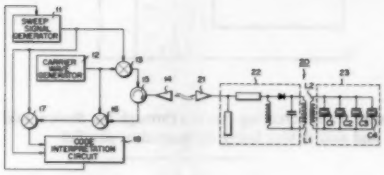
Int. Cl.³ G01S *9/56*

U.S. Cl. 382—1 **3 Claims**

1. A foreground subject-identifying apparatus comprising: signal-transmitting means, which, in a first operation mode, intermittently sends forth a microwave check signal hav-

ing at least a first frequency, and, in a second operation mode, emits a microwave question signal having at least a second frequency which is different from the first frequency;

a responding device including a transmitting/receiving antenna, a nonlinear circuit connected to said transmitting-/receiving antenna, a coding section including a plurality of resonance circuits, and electromagnetically coupling means connected between said nonlinear circuit and coding section to transfer a signal therebetween, said responding device generating a first prescribed code signal in



response to a check signal delivered from said signal-transmitting means, and producing a second specified code signal in response to a question signal supplied from said signal-transmitting means; and

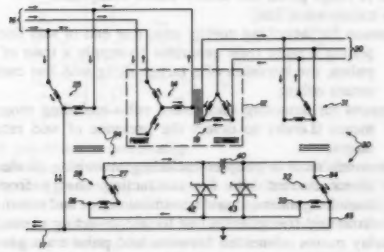
signal-receiving and interpreting means which sets the signal-transmitting means at the second operation mode in response to a first code signal from said responding device, and is actuated in response to a second code signal delivered from said responding device to produce an output signal corresponding to the second code signal, said signal-transmitting means and signal-receiving and interpreting means constituting an interrogating device.

4,458,236

COMMUNICATIONS SIGNAL COUPLING AROUND WYE/DELTA POWER TRANSFORMATION

William C. Perkins, Sachse, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 13, 1982, Ser. No. 367,848
Int. Cl.³ H04B *3/54*
U.S. Cl. 340—310 R **10 Claims**



10. A circuit for bi-directionally coupling a communications signal, having a carrier frequency, from first three-phase lines and neutral conductor to second three-phase lines, with the ratio of the power voltages on the first lines to the power voltages in the second lines being R, and wherein the communications signal is to be transmitted as a balanced phase-to-neutral signal on said first lines and as a phase-to-phase signal on said second lines, comprising:

a transformer having an open wye primary and an open delta secondary with one terminal common to the two secondary windings thereof and two available terminals, said primary having each of the two windings thereof connected to a different one of said first three phase lines and the node of the open wye connected to said neutral conductor,

a capacitor having first and second terminals, the first terminal thereof being connected to one of said available terminals of said secondary, and

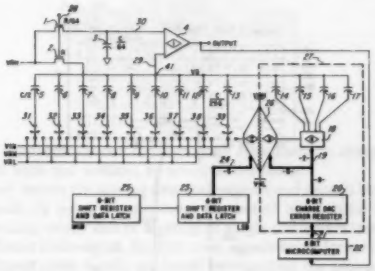
means, connected to each of said second three-phase lines and to said second capacitor terminal and to the other of said available terminals of said secondary, for coupling said signal between said second lines and said secondary.

4,458,237

COMBINATION OF AN ANALOG TO DIGITAL CONVERTER WITH A SAMPLING SWITCH ERROR CORRECTION CIRCUIT AND LEAST SIGNIFICANT BIT CIRCUIT

John C. Domogalla, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 3, 1981, Ser. No. 317,714
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD **4 Claims**


OUTPUT
6-BIT SHIFT REGISTER AND DATA LATCH
6-BIT SHIFT REGISTER AND DATA LATCH
6-BIT CHARGE DAC ERROR REGISTER
8-BIT MICROCOMPUTER

1. In a combination of a analog to digital converter having a comparator means with a first and second terminal for comparing signals on the first terminal to signals on the second terminal-first and second reference terminal means for providing a first and second reference signal to the analog to digital converter-an analog input means for receiving an analog signal for conversion to a digital signal-a plurality of capacitors connected in a capacitor array each with a first and second side the first side being connected to a node-the plurality of capacitors having the first side connected together and to the first terminal, for redistributing of charge representative of the analog signal-sampling switch means for obtaining a digital representation of the analog signals, and includes; a first switch means for selectively connecting and disconnecting the reference terminal means to the second terminal, a second switch means for selectively connecting and disconnecting the reference terminal means to the first side of the capacitor array, a third switch means for selectively connecting and disconnecting each second side of the plurality of capacitors between the reference terminal means and the analog input means, and switch control means for controlling the selective connection and disconnection of the first, second and third switch means to the reference terminal, disconnecting the first and second switch means from the reference terminal and connecting the third switch means from the reference terminal means to the analog input means-and an error corrector means for compensating for anomalies in each member of the plurality of capacitors, including reference capacitor connected to the second terminal, supplemental charge circuitry means connected in parallel to the capacitor array for adjusting the charge stored in the capacitor array, error control means for controlling of the adjustment of the charge stored in the capacitor array, and register means for retaining the charge adjustment of each member capacitor of the plurality of capacitor-and a least significant bit capacitor equivalent means for equivalenting the

smallest members of the plurality of capacitors; the least significant bit capacitor equivalent means comprises:

a series connected resistor array;

a second plurality of capacitors being binary weighted and connected in an array; both the series connected resistor array and the second plurality of capacitors being also in parallel connection with the capacitor array.

4,458,238

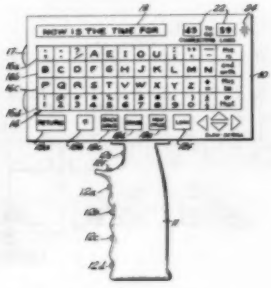
HAND HELD DATA ENTRY UNIT

Dale H. Learn, Field Ter., Irvington, N.Y. 10533

Filed Jan. 28, 1982, Ser. No. 343,441

Int. Cl.³ G06F *3/02*

U.S. Cl. 340—365 R **12 Claims**



1. A data entry unit comprising:

a matrix of cells arranged in M columns and N rows, each of said cells being adapted to correspond to an item of data,

means to sequentially illuminate each of said M columns in a continuous cyclic fashion,

a manually actuable set of at least N switches, each of said N switches serving to actuate one of N selection circuits that is coupled to a separate one of said N rows,

enabling means correlated to said illumination of one of said M columns and to the manual actuation of one of said N switches to select the data represented by the one of said cells determined by said illuminated column and said manually selected row, and

memory means for retaining said selected data.

4,458,239

FIRE EXTINGUISHING APPARATUS

Michael R. Willey, 19 Hollydale Close Reading, Berkshire, and Raymond Jolliffe, 24 Cathedral Rd., Cardiff, both of England

PCT No. PCT/GB80/00197, § 371 Date Jul. 15, 1981, § 102(e) Date Jul. 15, 1981, PCT Pub. No. WO81/01369, PCT Pub. Date May 28, 1981

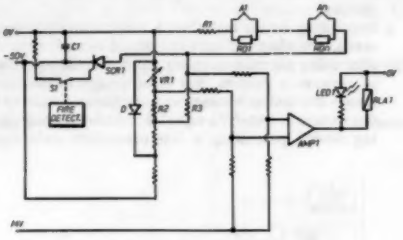
PCT Filed Nov. 14, 1980, Ser. No. 285,091

Claims priority, application United Kingdom, Nov. 15, 1979, 7939517

Int. Cl.³ G08B *21/00*; A62C *37/18*

U.S. Cl. 340—540 **3 Claims**

1. Fire extinguishing apparatus comprising a series of components connected in series, and means for applying an electrical signal to the component at one end of said series and to the component at the other end of said series so that the signal flows through each component of said series, each component comprising an actuator and a device whose resistance decreases with increasing current through the device, said actuator and said device being connected in parallel.



4,458,240

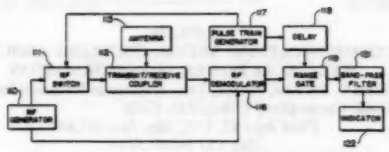
ENERGY WAVE ELECTRONIC INTRUDER DETECTION SYSTEM

Otto E. Rittenbach, Monmouth County, N.J., and Reinhard G. Olesch, Kronberg, Fed. Rep. of Germany, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 973,402, Dec. 26, 1978, Pat. No. 4,326,272, which is a continuation-in-part of Ser. No. 840,206, Oct. 7, 1977, Pat. No. 4,187,501. This application Aug. 31, 1981, Ser. No. 297,677

Int. Cl.³ G08B *13/24*

U.S. Cl. 340—552 **10 Claims**



1. A range gated line sensor which comprises:

a transmission line;

means for launching energy onto one end of said line comprising a pulse train generator to supply a train of video pulses, the intrusion of a target along said line causing a return echos;

means for detecting said return echo including range gate means thereby to detect the presence of said returning target;

transmit/receive coupler including switching diodes with direct current bias for conducting energy from said launching means to said transmission line and return echos from said transmission line to said detecting means;

delay means connected between said pulse train generator and said range gate means for providing time base signals; and,

wherein said transmission line is non-deformable and comprises first and second open wires embedded in a rigid non-conducting member.

4,458,241

DEVICE FOR PROTECTING WORKS OF ART

Henry E. Frankenberg, Sarasota, Fla., assignor to Psi Limited, Olympia Fields, Ill.

Filed Sep. 1, 1981, Ser. No. 290,363

Int. Cl.³ G08B *13/14*

U.S. Cl. 340—571 **9 Claims**

1. An anti-theft device for mounting on the backside of a

painting canvas or the like comprising a pair of intersectingly arranged contact elements disposed, in the mounted position of the painting, in selectively open (non-contacting) or closed (contacting) positions with respect to each other, means including an alarm and a circuit connected through said contact elements for setting off the alarm, means movably mounting at least one of said contact elements with respect to the other for

movement from open to closed position to actuate the alarm circuit upon movement of said painting, and means for inhibiting touching of the canvas comprising movement translating means disposed on said one of said contact elements in opposition to the backside of the canvas for movement thereby into circuit alarm operating position upon predetermined deflection of the canvas.

4,458,242

GAS DETECTOR

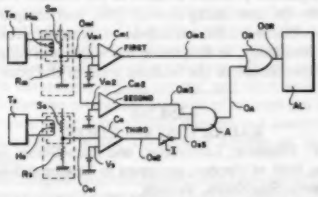
Shigekazu Kusanagi, Katano; Shigeo Akiyama, Kadoma, and Tohru Nobutani, Osaka, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Sep. 14, 1981, Ser. No. 302,162

Claims priority, application Japan, Oct. 25, 1980, 55-149760; Oct. 25, 1980, 55-149759

Int. Cl.³ G08B *17/10*

U.S. Cl. 340—634 **8 Claims**



1. A gas detector comprising:

a main signal processing unit, including: a main gas sensing element for sensing a change in electric resistance to both a detection target and non-target gases and outputing a first alarm driving signal by detecting a target or nontarget gas exceeding a first specified level;

a sub-signal-processing unit including: a circuit unit coupled to said main gas sensing element for outputing a second alarm driving signal by detecting gas exceeding a second level of concentration set at lower than the first specified level, an auxiliary gas sensing element showing a change in electrical resistance particularly in response to a nontarget gas a gate signal trigger unit coupled to said auxiliary gas sensing element for blocking the second alarm driving signal, by detecting non-target gas with a concentration exceeding a third specified level;

an alarm triggering means that is actuated in response to the first or second driving alarm signal; and

said auxiliary gas sensing element being made from magnesium oxide, chromium oxide, zirconium oxide wherein the molar ratios of magnesium oxide Mm, chromium Mc, zirconium oxide Mz are:

$$\frac{Mz}{\frac{Mm + Mc}{2} + Mz} = 0.01 \simeq 0.5.$$

4,458,243

ELECTRONIC DEVICE FOR DISPLAYING ACCENTS

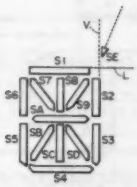
Ichiro Sado, and Juji Kishimoto, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 145,005, Apr. 29, 1980. This application Apr. 8, 1982, Ser. No. 366,577

Claims priority, application Japan, May 8, 1979, 54-55269

Int. Cl.³ G09G *3/04*

U.S. Cl. 340—756 **11 Claims**



1. An electronic device for displaying alphanumeric characters both with and without an accent comprising:

memory means for storing first code signals and second code signals, by using the minimum number of bits needed for encoding every one of a group of single characters into a different code signal, the first code signals being formed as different code signals produced by encoding the group of single characters and by using the minium number of bits, the second code signals being formed as different code signals that are different from the first code signals and are produced by encoding accentuated single characters included in the group of single characters;

display means including a plurality of single character display parts and an accent display part provided for each character display part and corresponding to the group of single characters; and

driving means for actuating said single character display parts of said display means in response to the first code signals read out from said memory means and for actuating said single character display parts and the accent display part in response to the second code signals read out from said memory means.

4,458,244

SELF SHIFT TYPE GAS DISCHARGE PANEL DRIVING SYSTEM

Hisashi Yamaguchi, Hyogo; Kazuo Yoshikawa, and Keizo Kurahashi, both of Kobe, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 29, 1981, Ser. No. 258,785

Claims priority, application Japan, Apr. 30, 1980, 55-58899; Apr. 30, 1980, 55-58898

Int. Cl.³ G09G *3/28*

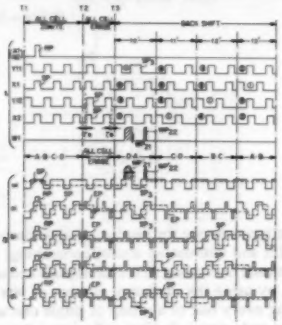
U.S. Cl. 340—768 **27 Claims**

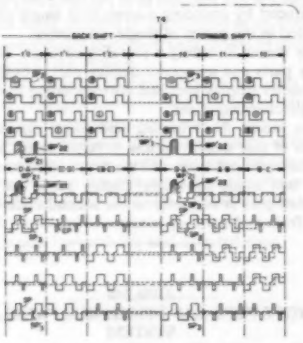
1. A self shift type gas discharge panel having plural rows for writing and shifting information in the form of discharge spots for display in selected rows, while displaying previously written information in the non-selected rows, said panel comprising

each said row including a plurality of shift channels of respective orders arranged in parallel, each said shift channel comprising a periodic arrangement of shift discharge cells formed by a periodic arrangement of plural groups of shift electrodes separated by a discharge space, each said

shift discharge cell being defined between opposing portions of respective pairs of said shift electrodes, a first set of said groups of electrodes being defined by each said group thereof including respective shift electrodes of the shift channels of all said rows, and a second set of groups being defined by each group thereof including respective electrodes from all the shift channels of a respective row, each said shift channel having a write electrode with a portion opposing a portion of a respective one of said shift electrodes of a respective one of said groups of said second set, to form a write discharge cell at one end of each said shift channel, all of the write electrodes corresponding to the shift channels of the same order of all of said rows being connected in common, and

control means for supplying shift pulses to said groups of electrodes for shifting and displaying said discharge spots





in a manner that is consistent with said periodic arrangement of shift discharge cells and so that a periodic sequence of different phases is attributable to said shift discharge cells along each said shift channel, for selectively applying write voltage pulses to the write electrodes, corresponding to information to be written into at least one selected row for display, wherein discharges at the respective write cells in the non-selected shift rows are prevented by applying first voltage pulses, which have the same polarity and at least the same time width as said write voltage pulses, to the respective group of shift electrodes of said second set having said portions opposing the write electrodes in the non-selected shift rows, when applying said write voltage pulses, so that the supply of said write voltage pulses to the write discharge cells of the non-selected rows is effectively cancelled.

4,458,245

METHOD AND APPARATUS FOR EXPLORING EARTH AND ROCKY FORMATIONS

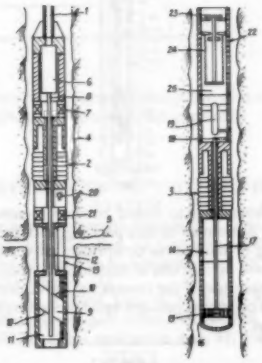
Bernard Crosnier, Montpellier; Pierre Duruisseaud, Nimes; Gilles Fras, Saint Mathieu de Treviers; Paul Jouanna, Montpellier, and Jean-Luc Portales, Lunel, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Paris, France

Filed Oct. 6, 1980, Ser. No. 194,221

Claims priority, application France, Oct. 11, 1979, 79 25285

Int. Cl.³ E21B *41/00*

U.S. Cl. 340—853 **11 Claims**



1. Process for determining the width and radial length of fissures in earth and rocky formations traversed by a bore hole comprising the steps of, isolating a zone of a predetermined length of the bore hole causing fluid in said isolated zone of the bore hole to flow alternately from the bore hole into and out of the surrounding formation in accordance with a predetermined flow function balancing the static pressure in the isolated zone of the bore hole, varying the frequency of the flow according to a range of frequency values, measuring for each frequency value the dynamic pressure created in the isolated zone of the bore hole by the alternating flow of fluid, and comparing with previously obtained data, variations of dynamic pressure and flow with frequency, to determine the width and radial length of at least one fissure in the isolated zone of the bore hole.

4,458,246

RADAR INSTALLATION

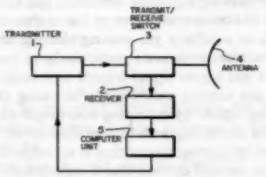
Hans A. V. Filipsson, Landvetter, and Lars-Göran Josefsson, Lindome, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation of Ser. No. 195,010, filed as PCT SE79/00185, Sep. 11, 1979, published as WO80/00618, Apr. 3, 1980, § 102(e) date Apr. 3, 1980, abandoned. This application Apr. 15, 1982, Ser. No. 368,894

Claims priority, application Sweden, Sep. 12, 1978, 7809551

Int. Cl.³ G01S *13/02*

U.S. Cl. 343—7.6 **4 Claims**



1. A radar installation for measuring target data by the radiation of electromagnetic energy search pulses and reception echo of pulses reflected from a target in response to a search

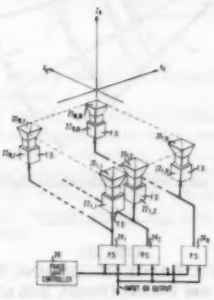
pulse, said installation being adapted for transmitting information, calculated on the basis of measured target data, to an information receiver other than the target(12–16), remote from said installation (11), the improvement comprising means for phase modulated coding a radiated search pulse with a complete message containing the information.

4,458,247

PHASED ARRAY ANTENNA EMPLOYING LINEAR SCAN FOR WIDE ANGLE ORBITAL ARC COVERAGE

Noach Amitay, Tinton Falls, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 11, 1981, Ser. No. 272,750
Int. Cl.³ H01Q *3/22, 3/24, 3/26*
U.S. Cl. 343—368 **4 Claims**



1. A method of permitting a linear scan of an antenna system disposed at a ground station on the surface of the earth to provide wide angle coverage of a predetermined circular or elliptical orbital arc segment around the earth and within the field of view of the ground station

characterized in that

the method comprises the steps of:

(a) orienting the antenna system in a terrestrial surface coordinate system of the earth comprising a first, second, and third axis (X_1, Y_1, Z_1) at the location of the ground station, where the terrestrial surface coordinate system of the earth is a translation of a polar coordinate system of the earth comprising a first, second and third axis (X, Y, Z), such that the orbital arc segment of interest lies in a predetermined plane substantially parallel to a cardinal plane in a directional cosine coordinate system of the antenna system;

(b) launching an electromagnetic energy beam in response to an input signal to the antenna system which is squinted by a predetermined amount by the antenna system toward the orbital arc segment, the combination of the orientation of the antenna system in step (a) and the amount of squint producing a minimum beam pointing error when scanning the beam over the orbital arc segment; and

(c) linearly scanning the antenna system to direct the electromagnetic energy beam in a predetermined manner to different points on the orbital arc segment.

4,458,248

PARAMETRIC ANTENNA

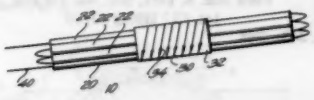
Arie Lyasko, Tel-Aviv, Israel, assignor to Haramco Research, Inc., Litchfield, Conn.

Filed Apr. 26, 1982, Ser. No. 371,810
Int. Cl.³ H01Q *1/04, 7/08*
U.S. Cl. 343—719 **15 Claims**

1. A parametric antenna suitable for use at extreme low frequencies and comprising

a plurality of elongated ferrite cores each having a central axis and an axial bore extending therethrough, the plurality of cores being bound together as a bundle with their axes thereof parallel;

a plurality of conductors each passing through the axial bore of a respective core to carry a control current; and



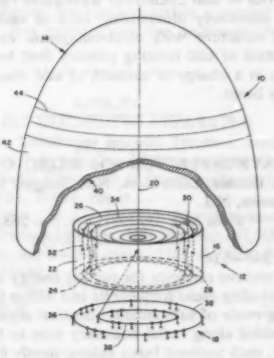
a helical antenna winding disposed circumferentially about said bundle of cores.

4,458,249

MULTI-BEAM, MULTI-LENS MICROWAVE ANTENNA PROVIDING HEMISPHERIC COVERAGE

Pasquale A. Valentino, Glen Head, and John J. Stangel, Mahopac, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 22, 1982, Ser. No. 350,796
Int. Cl.³ H01Q *19/06*
U.S. Cl. 343—754 **8 Claims**



1. A multi-beam microwave antenna providing wide-angle coverage comprising:

a first plurality of beamports constrained to lie along a first focal ring which corresponds to a first preselected elevation;

a second plurality of beamports constrained to lie along a second focal ring which corresponds to a second preselected elevation;

a non-planar dome microwave lens substantially subtending a hemisphere; and

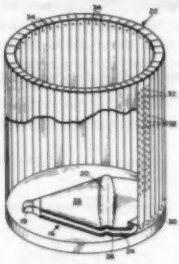
a multi-beam 3-D bootlace microwave lens positioned between said beamports and said non-planar microwave lens for electromagnetically coupling respective ones of said beamports to corresponding preselected apertures of said non-planar dome microwave lens the field of view of which displays a 360° azimuth at a preselected elevation.

4,458,250

360-DEGREE SCANNING ANTENNA WITH CYLINDRICAL ARRAY OF SLOTTED WAVEGUIDES

Donald G. Bodnar, Atlanta, Ga., and Jams W. Cofer, Jr., Indialantic, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 5, 1981, Ser. No. 271,056
Int. Cl.³ H01Q *13/10*
U.S. Cl. 343—768 **12 Claims**



1. A waveguide antenna assembly for providing selective scanning of an electromagnetic energy beam comprising:

a plurality of waveguides disposed with respect to each other so as to form a cylindrical waveguide radiating array structure having an interior cylinder surface and an exterior cyliner surface, each of said plurality of waveguides having means for radiating electromagnetic energy out from said exterior cylinder surface;

means for selectively scanning said electromagnetic energy beam in azimuth over a range of 360° comprising a rotating primary feed horn assembly positioned within the interior of said cylindrical waveguide radiating structure for selectively illuminating each of said waveguides of said structure with electromagnetic energy such that rotation of said rotating primary feed horn assembly results in a change of azimuth of said electromagnetic energy beam.

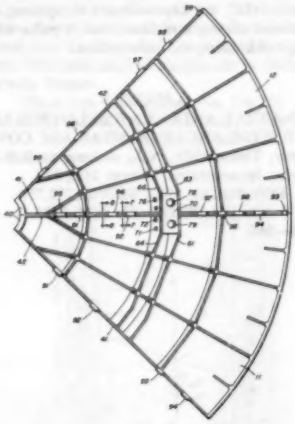
4,458,251

CONCAVE REFLECTOR FOR RADIO ANTENNA USE

David L. Bondon, Colts Neck, N.J., assignor to Prodelin, Inc., Highstown, N.J.

Filed May 19, 1981, Ser. No. 265,214
Int. Cl.³ H01Q *15/16*
U.S. Cl. 343—914 **13 Claims**

1. A concave reflector for radiant energy in the frequency range including radio frequencies and visible light, said reflector being made of substantially identical segments which can be assembled along radial boundary lines to form a complete reflector, each segment being independently formed in a fixed substantially rigid configuraton of moldable material having a front portion providing a segment of reflector surface and a rear portion containing integrally-formed rigidizing ribs including at least a first radial rib along a first radial edge and a second radial rib along the second radial edge of said segment, means for fastening the first rib of one segment to the second rib of a next-adjoining segment in the assembly of a complete reflector, said first and second ribs including integrally-formed indexing means for so mating each pair of adjoining first and second ribs when the latter are fastened together during assembly of a complete reflector that said segments of reflector surface form a substantially continuous reflector in which meeting edges of adjoining segments are substantially flush with each other, in which said indexing means comprises a first set of tabs on the rear edge of each first rib which overlie and touch the rear edge of the second rib to which it is fastened, and a second set of tabs on said rear edge of said second rib which overlie and touch the rear edge of said first rib, said tabs of said first set being alternated with said tabs of said second set in a radial direction when said two adjoining ribs are fastened



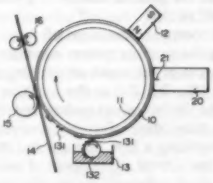
rogether thereby assuring a substantially flush front reflector surface.

4,458,252

MAGNETIC IMAGE RECORDING DEVICE

Yohsiki Kikuchi, and Takashi Ohmori, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1981, Ser. No. 309,343
Claims priority, application Japan, Oct. 7, 1980, 55-139410
Int. Cl.³ G01D *15/12*
U.S. Cl. 346—74.4 **7 Claims**



1. In a magnetic image recording device of the type including a magnetic medium, means for magnetizing said magnetic medium uniformly in one direction, heating means for heating selected portions of said magnetic medium in accordance with image data, and means for applying magnetic toner to said magnetic medium to form an image on said magnetic medium, the improvement comprising:

said heating means heating said selected portions of said magnetic medium to temperatures substantially lower than the Curie temperature of said magnetic medium to thereby reduce the magnetization intensities of said selected portions.

4,458,253

THERMAL PRINT APPARATUS USING A THERMAL TRANSFER RIBBON SUCH AS A MULTI-COLORED ONE, AND A PRINTING METHOD

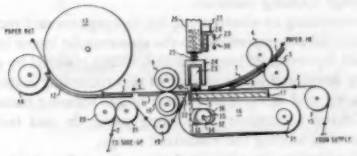
Willie Goff, Jr., and Ta C. Ku, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,918
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **11 Claims**

1. A thermal print apparatus for printing on print media with

a thermal transfer ribbon such as a multi-colored one wherein colors are arranged in sets of transverse stripes, by means of a heat applying print head arranged transverse to the media transport direction and a backing means urging the media against the ribbon and the latter against the print head; said apparatus comprising:

(a) a ribbon supporting means mounted for selective movement relative to said media for bringing said thermal ribbon into contact with said media and for releasing it from contact with said media;



(b) means for moving said ribbon supporting means relative to said media, and

(c) means for guiding said thermal ribbon away from said media at an angle greater than 45 degrees thereto, so that upon retraction of said ribbon supporting means away from said media said ribbon is separable from said media in a substantially normal direction whereby shear motion between said thermal ribbon and said media is significantly reduced.

4,458,254

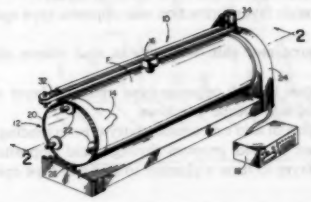
LOW INERTIA PLOTTER

Heinz J. Gerber, West Hartford, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Jun. 7, 1982, Ser. No. 385,714

Int. Cl.³ G01G *15/24*

U.S. Cl. 346—134 **21 Claims**



1. A low inertia plotter comprising a frame, a plotting instrument carried by said frame, a carrier having a surface for carrying a sheet of plotting media and consisting solely of a relatively thin sheet of material, carrier supporting means peripherally supporting said carrrier for movement relative to said frame to effect movement of said carrier in one coordinate direction relative to said plotting instrument, drive means for driving said carrier in said one coordinate direction, means supporting said plotting instrument for movement relative to said frame to effect movement of said plotting instrument in another coordinate direction relative to said carrier and in plotting relation to a sheet of plotting media carried by said surface, and drive means for driving said plotting instrument in said other coordinate direction.

4,458,255

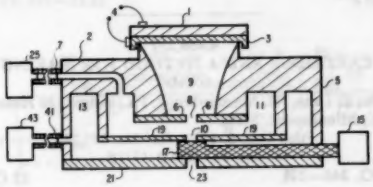
APPARATUS FOR CAPPING AN INK JET PRINT HEAD

Robert R. Giles, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 166,278, Jul. 7, 1980, abandoned. This application Mar. 12, 1982, Ser. No. 357,522

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **6 Claims**



1. An ink jet print head for discharging ink droplets, the ink jet print head comprising:

a housing including an ink chamber for containing ink and an air chamber for containing pressurized air, said housing further including a first channel connecting the ink chamber with the air chamber and a discharge channel connecting the air chamber with the ambient atmosphere outside of the housing, said discharge channel being axially aligned with the first channel;

urging means for causing ink to be ejected from the ink chamber, said urging means being mounted to the housing and impinging upon the ink resident in the ink chamber; and

a solid shutter for selectively blocking the first channel and the discharge channel, the solid shutter being positioned for slideable radial engagement within the air chamber such that in a first position both the first channel and the discharge channel are blocked and in a second position neither the first channel nor the discharge channel is blocked.

4,458,256

INK JET RECORDING APPARATUS

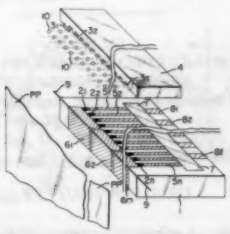
Yoshiaki Shirato, Yokohama; Yasushi Takatori, Sagamihara; Toshitami Hara, Tokyo; Yukuo Nishimura, Sagamihara, and Michiko Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 123,704, Feb. 22, 1980, abandoned. This application Apr. 12, 1982, Ser. No. 367,765

Claims priority, application Japan, Mar. 6, 1979, 54-25928; Apr. 2, 1979, 54-39480

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **22 Claims**



1. In an ink jet recording apparatus which comprises a plurality of actuating portions for a recording ink, lead electrodes connected to said actuating portions for conducting current thereto, said actuating portions and lead electrodes being

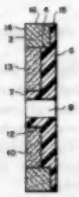
formed on a substrate, each of said actuating portions being provided with a chamber communicating with a port for ejecting the recording ink and for accommodating the recording ink before ejection, the ink being ejected from the port to form droplets for recording on a recording member, the improvement comprising a conductive member disposed on a surface of the substrate which is at a side where the ink droplets are ejected, said conductive member being a part of said lead electrodes.

4,458,257

INK CARTRIDGE AND A METHOD FOR MAKING THE SAME

Charles E. Lane, III, Meadowbrook, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 8, 1982, Ser. No. 447,742
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—141 **12 Claims**



1. An ink cartridge comprising

a support shaft

a plurality of ink containing layers attached to said shaft, each of said layers having pores edged with an impact resistant material in a radially outward edge face

and

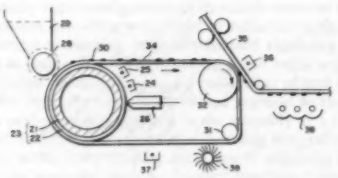
a plurality of ink impervious layers attached to said shaft, each of said ink impervious layers being integrally molded with a side face of a respective one of said ink containing layers to isolate said ink containing layers from each other along said shaft and to provide said impact resistant material for edging said pores.

4,458,258

IMAGE RECORDING METHOD

Mikio Amaya, Kawasaki; Masatoshi Kimura, Yokohama; Isao Kondo, Zama, and Masakatsu Horie, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 200,218, Oct. 24, 1980, abandoned. This application Mar. 5, 1982, Ser. No. 355,198
Claims priority, application Japan, Nov. 6, 1979, 54-143598; Nov. 6, 1979, 54-143596
Int. Cl.³ G03G *13/14*
U.S. Cl. 346—153.1 **17 Claims**



1. An image recording method comprising the steps of:

(a) forming an electrostatic latent image corresponding to an image to be recorded on the surface of an electrostatic latent image forming material, said forming step comprising the steps of

(i) first uniformly neutralizing any charges on the electrostatic latent image forming material with a discharging corotron,

(ii) then uniformly charging the surface of the electrostatic latent image forming material with a charging corotron, and

(iii) then forming an electrostatic latent image on said surface through discharging by applying a voltage to a pin electrode in non-contact very close to the surface of the electrostatic latent image forming material,

(b) laying a recording material having a high resistance value and dielectric coefficient on said electrostatic latent image forming material,

(c) visualizing an electrostatic latent image on said recording material corresponding to the electrostatic latent image of said electrostatic latent image forming material by supplying developer to the surface of said recording material not facing said electrostatic latent image forming material,

(d) laying an ordinary recording paper on said recording material storing the visualized image,

(e) duplicating the visualized image formed on said recording material onto said ordinary recording paper by duplication means, and

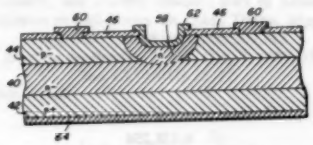
(f) fixing the developer on said ordinary recording paper.

4,458,259

ETCHED-SOURCE STATIC INDUCTION TRANSISTOR

Adrian I. Cogan, Waltham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 12, 1981, Ser. No. 320,242
Int. Cl.³ H01L *29/80, 29/06*
U.S. Cl. 357—22 **1 Claim**



1. A gate-source structure for a static induction transistor comprising:

a high resistivity epitaxial layer of one conductivity type;

a high resistivity epitaxial layer of opposite conductivity type formed on said one-type epitaxial layer;

a silicon dioxide layer formed on said opposite-type epitaxial layer;

parallel source and gate windows in said silicon dioxide layer;

source groove in said opposite-type epitaxial layer at the location of said source windows;

diffused region of said one conductivity type extending from the surface of said grooves through said opposite-type epitaxial layer to form a channel to said one-type epitaxial layer;

gate electrodes deposited on said opposite-type epitaxial layer at said gate window locations; and

source electrode deposited on said diffused region at said source groove surface.

4,458,260

AVALANCHE PHOTODIODE ARRAY

Robert J. McIntyre, Pointe-Claire, and Paul P. Webb, Beaconsfield, both of Canada, assignors to RCA Inc., Ste. Anne-de-Bellevue, Canada

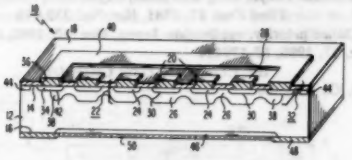
Filed Nov. 20, 1981, Ser. No. 323,200
Claims priority, application Canada, Oct. 6, 1981, 387431
Int. Cl.³ H01L *27/14, 31/00, 29/90*
U.S. Cl. 357—30 **9 Claims**

1. An avalanche photodiode array comprising

a body of semiconductor material of a first conductivity type and having two opposed major surfaces;

a plurality of regions of a second conductivity type extending a distance into the body from portions of a first major surface and being spaced apart from one another;

a region of said first conductivity type containing an excess concentration of said first type conductivity modifier, said region comprising sub-regions extending a further distance into the body from each of the regions of said second conductivity type, thereby forming p-n junctions with



the regions of said second conductivity type, wherein the concentration of said first type conductivity modifier decreases with increasing distance from the p-n junctions and wherein neighboring sub-regions of said first conductivity type overlap one another;

a contacting region containing an excess concentration of said first type conductivity modifier and extending a distance into the body from a second major surface thereof; and

electrical contacts to the regions of said second conductivity type and to said contacting region.

4,458,261

INSULATED GATE TYPE TRANSISTORS

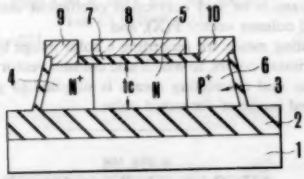
Yasuhisa Omura, Iruma, Japan, assignor to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 304,281

Claims priority, application Japan, Sep. 19, 1980, 55-129067

Int. Cl.³ H01L *29/78*

U.S. Cl. 357—23.7 **14 Claims**



1. An insulated gate type transistor comprising:

an insulating layer;

an active region made of a first conductive type semiconductor formed on said insulating layer;

a first region made of a high impurity concentration semiconductor having a first conductivity type and located adjacent to said active region;

a second region made of a high impurity concentration semiconductor of a second conductivity type adjacent to said active region but apart from said first region;

a gate insulating film formed on said active region;

a gate electrode formed on said gate insulating and; a portion of said active region having a thickness less than $\pi/2$ times of a Debye length inherent to the semiconductor constituting said active region.

4,458,262

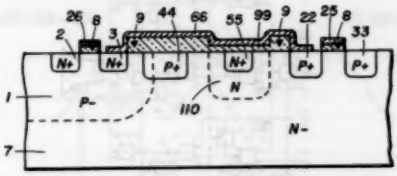
CMOS DEVICE WITH ION-IMPLANTED CHANNEL-STOP REGION AND FABRICATION METHOD THEREFOR

Robert L. Chao, Sunnyvale, Calif., assignor to Supertex, Inc., Sunnyvale, Calif.

Filed May 27, 1980, Ser. No. 153,577

Int. Cl.³ H01L *29/78*

U.S. Cl. 357—23.11 **2 Claims**



1. A MOS integrated circuit comprising, in combination:

a substrate region of a relatively low doping level of a first conductivity type;

a first region of a second conductivity type opposite said first conductivity type in said substrate;

a first MOS device comprising a source and a drain of said first conductivity type and a channel region extending between said source and drain, said first MOS device located in said first region of said second conductivity type;

a second MOS device comprising a source and a drain of said second conductivity type and a channel region extending between said source and drain, said second MOS device located in said substrate;

a further region of said first conductivity type and having higher doping than said substrate but lower doping than the doping concentration in said source or drain region of said first MOS device located in said substrate intermediate said first and said second MOS devices;

a second region of said first conductivity type located within said further region of said first conductivity type, said second region of said first conductivity type having the same doping concentration and depth as said source and drain regions of said first MOS device;

a first thin oxide region located over said further region and said channel regions;

a second oxide region having a larger thickness than said first oxide region located over another portion of said substrate; and

conductive means for interconnecting said first and said second MOS devices, said conductive means lying over both said first oxide region over said further region and said second oxide region.

4,458,263

VIDEO SIGNAL PROCESSING CIRCUIT FOR A COLOR TELEVISION RECEIVER

Evert H. Schutte, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 18, 1982, Ser. No. 340,180

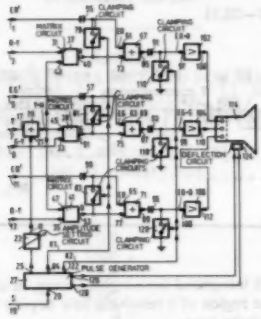
Claims priority, application Netherlands, Feb. 9, 1981, 8100604

Int. Cl.³ H04N *9/52, 9/535*

U.S. Cl. 358—30 **2 Claims**

1. A video signal processing circuit for a color television receiver having inputs for a luminance signal, for color difference signals and for external color signals, comprising respective matrix circuits for combining the respective color difference signals with the luminance signal to form respective color signals, respective first clamping circuits for clamping the respective external color signals onto the respective color

signals, respective combining circuits for combining the respective clamped external color signals with the respective color signals, respective second clamping circuits for clamping the outputs of the respective combining circuits onto a predetermined level, and a brightness setting circuit, characterized in that the first clamping circuits act on a first reference level in said respective external color signals occurring in a first



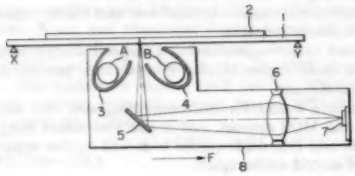
group of periods and the second clamping circuits act on a second reference level occurring in a second group of periods which differ from the periods of the first group, while the brightness setting circuit is an amplitude setting circuit for a level shift signal, which is combined with the luminance signal prior to processing the color difference signals, with which the relative position of the second reference level with respect to the remaining portion of the luminance signal is adjustable.

4,458,264

APPARATUS AND METHOD FOR READING MULTI-COLOR ORIGINAL

Yasuyuki Tamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1982, Ser. No. 339,167
Claims priority, application Japan, Jan. 20, 1981, 56-7024
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—75 **6 Claims**



1. An apparatus for reading a multi-color original comprising:

plural light sources for illuminating an original with lights of mutually different colors;

an imaging device for reading an original image based on reflected light from said original;

control means for turning on and off said plural light sources to sequentially illuminate the original with lights of mutually different colors;

signal means for producing a read-out start signal for causing said imaging device to perform the reading operation according to exposure of each color, in synchronism with the turning on and off of said plural light sources;

transfer means for generating a transfer signal to transfer a read image signal from said imaging device based on said read-out start signal; and

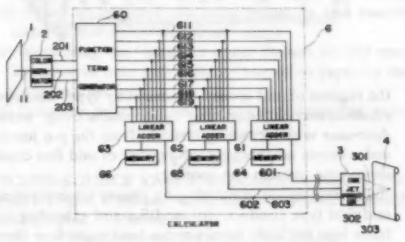
process means for processing the image signals sequentially derived from said imaging device, each image signal being associated with one of the lights of mutually different colors, and for forming a color image signal.

4,458,265

COLOR IMAGE DUPLICATING SYSTEM

Kunio Yoshida; Hiroaki Kotera; Yukifumi Tsuda, all of Kawasaki; Yoshimitsu Kanno, Sagamihara, and Motohiko Naka, Kawasaki, all of Japan, assignors to Matsushita Research Institute Tokyo, Inc., Kawasaki, Japan

Filed Dec. 17, 1981, Ser. No. 332,098
Claims priority, application Japan, Dec. 17, 1980, 55-179423; Dec. 17, 1980, 55-179424
Int. Cl.³ H04N *1/46*; G03F *3/08*
U.S. Cl. 358—80 **13 Claims**



1. A color image duplicating system comprising:

a color separating means for scanning an original color image and obtaining m color separated vector data input $\overline{X}$ from each picture element,

a function generating means connected to said color separating means for generating column vector $\overline{F}(\overline{X})$ of n rows having as elements thereof n functions wherein each of elements of said m color separated vector data input $\overline{X}$ is a variable,

memory means for storing each element of a correction coefficient matrix (A) having l rows and n columns,

calculating means connected to said function generating means and memory means for obtaining a column vector $\overline{Y}$ of l rows which is expressed by $\overline{Y}=(A)\overline{F}(\overline{X})$ by the utilization of said correction coefficient matrix (A) and said column vector $\overline{F}(\overline{X})$, and

a printing means for recording a color image by combining l primary colors, to which said column vector $\overline{Y}$ outputted from said calculating means is supplied to give a duplicated image of corrected color.

4,458,266

VIDEO MOVEMENT DETECTOR

Trevor W. Mahoney, Modbury North, Australia, assignor to The Commonwealth of Australia, Canberra, Australia

PCT No. PCT/AU81/00149, § 371 Date Jun. 11, 1982, § 102(e) Date Jun. 11, 1982, PCT Pub. No. WO82/01454, PCT Pub. Date Apr. 29, 1982
PCT Filed Oct. 21, 1981, Ser. No. 395,076
Claims priority, application Australia, Oct. 22, 1980, PE6171
Int. Cl.³ H04H *7/18*
U.S. Cl. 358—105 **15 Claims**

1. The method of detecting motion by means of a video detector which consists in:

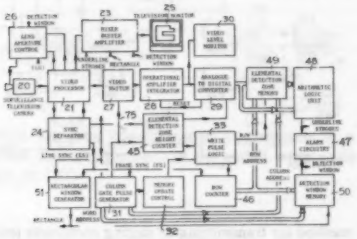
(a) directing at least one television camera (20) into the surveillance area,

(b) reproducing the image from the said camera on a TV screen (25),

(c) dividing the TV screen display into a matrix of elemental detection zones (15) positioned in a selected number of

columns with each detection zone (15) being a selected number of scan lines high,

(d) processing the elemental detection zones (15) in each column in a sequential manner with at least one selected column processed in each TV frame by submitting a first detection zone (15) in the said column to an integrator (28) and continuing integration of the signal in the said column until, at the end of a selected gate pulse (75), a start conversion pulse is applied to an analogue-to-digital converter (29) to issue a "busy" signal and holding the "busy" condition while conversion to a digital format is in progress, whereby at the last scan line conversion to digital format in the analogue-to-digital converter (29) occurs,



(e) placing the digital format into a memory (49),

(f) resetting the integrator (28) to process the next elemental detection zone (15) of the said column until the zones (15) in the said column are completed and then sequentially similarly submitting all remaining columns to the said integrator (28) one for each succeeding frame,

(g) comparing subsequently produced scans with earlier corresponding scans to detect errors (62) representing movement, and

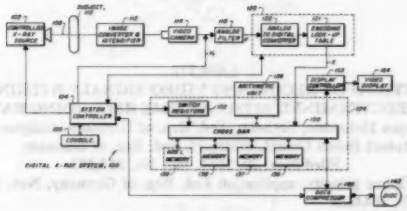
(h) defining by means of at least a window (16) of selectable dimensions those errors (62) to be directed to the alarm circuitry (47).

4,458,267

DIGITAL X-RAY SYSTEM

Enrico Dolazza, Boston, Mass., assignor to Analogic Corporation, Wakefield, Mass.

Filed Oct. 6, 1981, Ser. No. 309,051
Int. Cl.³ H04N 7/18
U.S. Cl. 358—111 **22 Claims**



1. A radiology system comprising:

an x-ray source for directing radiation through an x-ray absorptive body;

means for receiving radiation from the source after passage through the body

to provide an analog signal in response to and representative of the intensity of the received radiation;

analog to digital converter means providing a digital signal according to a digitization interval related to the intrinsic uncertainty of the signal, assuring that information lost from digitization is less than a predetermined amount of signal information relative to the intrinsic uncertainty of the signal of the incoming analog signal; and

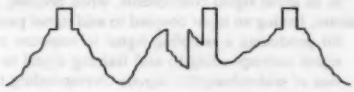
means for storing the digital signal.

4,458,268

SYNC DISPLACEMENT SCRAMBLING

Walter Ciciora, Park Ridge, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 8, 1982, Ser. No. 338,464
Int. Cl.³ H04N 7/16
U.S. Cl. 358—120 **11 Claims**



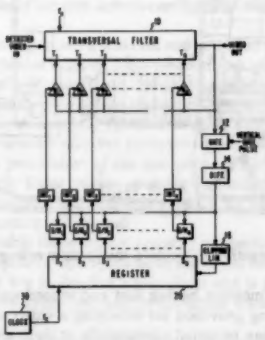
1. In a television signal transmission and receiving system of the type having transmitting means for developing and transmitting a television signal including nominally positioned horizontal and vertical synchronization signals and means for receiving said transmitted television signal and forming a synchronized video image in response to said nominally positioned synchronization signals, the improvement wherein said transmitting means includes means for replacing each of at least some of said nominally positioned horizontal synchronization signals with a surrogate horizontal synchronization pulse displaced in time therefrom and for inserting a video signal patch in said television signal at each position corresponding to a replaced nominally positioned horizontal synchronization signal, said video signal patch being derived from the portion of said television signal to which said surrogate horizontal synchronization pulse was displaced so as to cause said receiving means to reproduce said television signal in an unsynchronized and scrambled form.

4,458,269

SAMPLING ARRANGEMENT FOR A TELEVISION GHOST SIGNAL CANCELLATION SYSTEM

Alfred C. Schroeder, Newtown, Pa., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 147,629, May 7, 1980, Pat. No. 4,314,277.
This application Apr. 10, 1981, Ser. No. 252,817
Int. Cl.³ H04N 5/21
U.S. Cl. 358—167 **6 Claims**



1. In a television ghost signal cancellation system, including a delay line having a plurality of taps connected to a plurality of weighting function circuits, wherein control of the weighting functions developed by said circuits determines the response characteristic of a transversal filter employing said

delay line; an arrangement for detecting the presence of a television ghost signal and its time of occurrence with respect to a reference signal comprising:

a source of video signals including a main signal which may be subject to contamination by a ghost signal, and including a main signal component available for use as a training signal, and its corresponding ghost signal components when said video signals are subject to said contamination;

means, having an input coupled to said video signal source, and an output, for passing a first signal corresponding to said training signal and subsequent signals corresponding to its ghost signal components, when present;

means, having an input coupled to said signal passing means for producing a sampling signal in response to said first signal corresponding to said training signal to the exclusion of said subsequent signals corresponding to its ghost signal components;

a serial shift register having an input coupled to receive said sampling signal, and parallel outputs, at which said sampling signal successively appears as it passes through said shift register;

a plurality of sampling circuits, each having a control input coupled to a respectively different output of said shift register, and a signal input coupled to the output of said signal passing means, and an output, wherein each of said sampling circuits samples the signal appearing at the output of said signal passing means at the respective time of application of said sampling signal to its control input; and

means for coupling the respective outputs of said sampling circuits to respective ones of said weighting function circuits for the development of said weighting functions.

4,458,270

NEGATIVE TO POSITIVE IMAGE CONVERTING APPARATUS

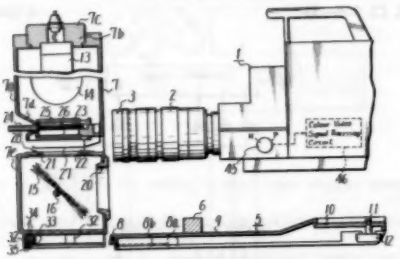
Osamu Kuno, Atsugi, and Tooru Takamiya, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 21, 1982, Ser. No. 370,402

Claims priority, application Japan, May 6, 1981, 56-65317[U]

Int. Cl.³ H04N *5/26, 5/30*

U.S. Cl. 358—225 **6 Claims**



1. A negative to postive image converting apparatus comprising:

a base member having first and second ends, said first end having provision for mounting a video camera thereon;

a housing mounted substantially at right angles to said second end of said base member, said housing comprising a lamp housing wherein a lamp holder is disposed, a mirror housing wherein a mirror is disposed for reflecting light originating from said lamp housing to said video camera, and a space between said lamp housing and said mirror housing into which a negative film can be inserted.

4,458,271

METHOD AND CIRCUIT FOR THE TRANSMITTING, RECORDING, AND/OR REPRODUCING OF WIDE-BAND SIGNALS

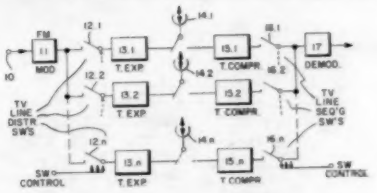
Winfried Horstmann, Griesheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 120,771, Feb. 12, 1980. This application Oct. 16, 1981, Ser. No. 312,293

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1979, 2908321

Int. Cl.³ H04N *9/491, 9/32, 5/91;* **G11B** *5/02*

U.S. Cl. 358—310 **8 Claims**



1. A method for transmitting or storing composite television signals in a plurality of narrow-band channels, comprising the steps of

frequency modulating the signals on a carrier to obtain a frequency modulated carrier signal;

then subdividing the frequency modulated carrier signal into sequential individual signal segments, respectively corresponding to different television lines, for signal processing of said individual signal segments in individual channels with distribution of said segments among said channels by switching performed in the intervals between television lines;

time expanding the individual signal segments in said individual channels;

transmitting or storing said individual signal segments in said individual channels;

subjecting the individual transmitted or stored signal segments to a reciprocal time compression at the terminus of the transmission line or in a step of retrieval from storage;

and recombining and demodulating the compressed signal segments collected from said channels.

4,458,272

METHOD OF RECORDING VIDEO SIGNALS WITHIN A PREDETERMINED BIT/UNIT TIME RECORDING RATE

Jürgen Heitmann, Seeheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 20, 1981, Ser. No. 323,393

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044624

Int. Cl.³ G11B *5/00, 5/09*

U.S. Cl. 360—8 **9 Claims**

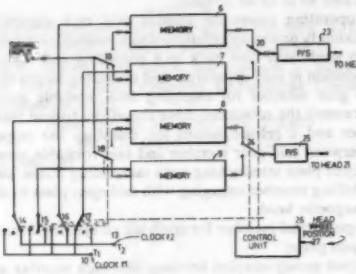
1. Method of recording video signals on a magnetic tape (1) without exceeding a predetermined bit/unit time recording rate,

in which the tape (1) is passed in a spiral path about a transducer scanning drum having a rotating head wheel (4) with two transducer heads, spaced 180° apart, which transduce signals on inclined trakcs on the tape,

comprising, in accordance with the invention,

prior to recording, transforming the video signals by time expansion,

passing the tape over the scanning drum wrapped or looped at an angle in excess of 180°;



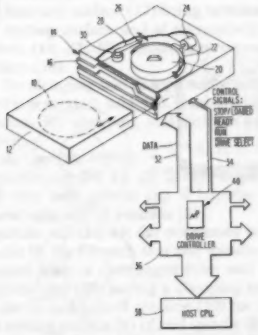
wherein the time transformation corresponds to a factor which includes the ratio of the actual wrap angle of the tape to 180°.

4,458,273

MAGNETIC DISK DRIVE CONTROL APPARATUS AND METHOD

Jerome P. Johnson, Ogden, Utah, assignor to Iomega Corporation, Ogden, Utah

Filed Apr. 28, 1981, Ser. No. 258,400
Int. Cl.³ G11B *15/48*
U.S. Cl. 360—74.1 **10 Claims**



10. In disk drive apparatus comprising a motor for rotating a magnetic disk in juxtaposition to a read/write head and microprocessor means for controlling the rotation of said disk and the motion of said head with respect to said disk;

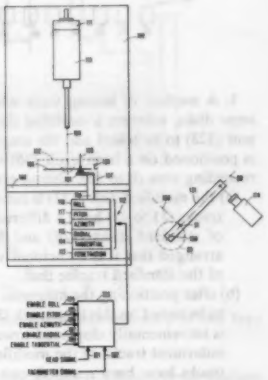
the improvement comprising said microprocessor further comprising clock means for precisely measuring the elapsed time between consecutive operations of said read/write head in response to commands received from a host computer and for discontinuing the running of said motor upon determination that the length of said elapsed time has exceeded a predetermined time.

4,458,274

MANUFACTURING METHOD AND APPARATUS FOR ADJUSTING THE POSITION OF A MAGNETIC HEAD IN A FLEXIBLE DISK DRIVE

Paul M. Charlson, Longmont, Colo.; Richard H. Estry, and Clarence R. Schwieters, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 22, 1982, Ser. No. 391,058
Int. Cl.³ G11B *5/42, 5/46*
U.S. Cl. 360—75 **33 Claims**



1. Apparatus for use in adjusting the position of a transducing head while the head is loosely held within or adjacent the head carriage of a disk drive in which the head is to be an integral operating part, the apparatus comprising:

support means adapted to receive a disk drive such that the spin-plane of the disk drive's spindle occupies a known plane in space, and the spindle's spin axis occupies an axis orthogonal thereto;

a master disk rotatable on said spindle, said master disk including an information track concentric with said orthogonal axis;

a movable head holder/manipulator initially holding a head in the vicinity of the disk drive's carriage and said point in space;

means for relatively moving said disk and said head such that the intersection of a given fixed-position disk radius and the center of said data track defines a point in space to which the head's information transducing surface is to be adjusted, said means being operable to move said holder/-manipulator toward said disk to thereby position the head with known penetration of the spin-plane of said disk;

a first reversible linear motor operably connected to said holder/manipulator and operable to move the head along said fixed-position radius; and

a second reversible linear motor operably connected to said holder/manipulator and operable to move the head along a line which lies in the disk's spin-plane and is gererally tangent to the center of said imformation track at said point in space;

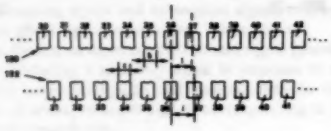
said first and second linear motors being adapted to be controlled by the head signal, as the head reads said information track, to thereby control said first linear motor to center the head's transducing surface on said track, and to control said second linear motor to adjust the head's transducing surface to a desired tangential position relative said fixed-position disk radius.

4,458,275

METHOD AND DEVICE FOR TESTING UNITS FOR PROCESSING MAGNETIC DISKS

Alberto Monti, Pavone, Italy, assignor to Olivetti Tecnost, S.p.A., Ivrea, Italy

Filed Mar. 9, 1981, Ser. No. 242,136
Claims priority, application Italy, Mar. 11, 1980, 67377 A/80
Int. Cl.³ G11B 21/08, 5/00
U.S. Cl. 360—78 8 Claims



1. A method of testing units which process standard magnetic disks, wherein a modified disk (122) is inserted into the unit (123) to be tested and the magnetic head (126) of the unit is positioned on a base track (36) in the central region of the recording area (0 to 56), characterized in that

(a) the modified disk (122) is recorded in such a way that its tracks (31 to 41) have a different pitch from that (30 to 42) of standard disks (120) and has the base track (36) so arranged that it is coincident with a predetermined track of the standard tracks; that

(b) after positioning the magnetic head (126) of the unit (123) to be tested on this base track (36) the magnetic head (126) is incrementally displaced towards the innermost and the outermost tracks of the modified disk (122) until two end tracks have been reached, one internal and one external, beyond which the head (126) causes cross-talk errors; and that

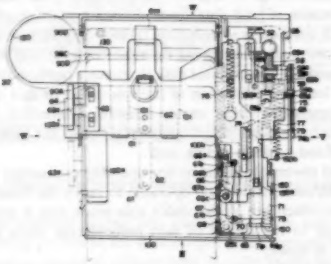
(c) the misalignment of the head (126) is calculated in respect of the axis of the tracks as the distance between the base track (36) and a hypothetical middle track centered between the internal end track and the external end track.

4,458,276

MAGNETIC TAPE RECORDING/REPRODUCING APPARATUS WITH EJECT SPRING SET BY TAPE DRIVE MOTOR

Hitoshi Okada; Kazuki Takai, and Katsumi Yamaguchi, all of Saitama, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1981, Ser. No. 315,962
Int. Cl.³ G11B 15/66, 23/06
U.S. Cl. 360—96.5 3 Claims



1. In a magnetic tape cassette recording and reproducing apparatus having a tape driving motor, reel drive bases, and at least one magnetic head movably responsive to movement of a movable head shifting member, the improvement comprising:

a rotatable member driven by said motor;

a sliding frame adapted to insertingly accept and slide in response to insertion of a tape cassette thereinto;

only a single rack member interlocking with said slidable frame so as to be slidable;

an operating means for causing said rack member to be slidingly driven by rotation of said rotatable member, so as to guide said tape pack to a recording and reproducing position in said apparatus, said operating means including a gear member for engaging said rotatable member to transmit the rotational drive therefrom to said rack member and a release means for releasing the engagement between said gear member and said rotatable member;

an eject plate interlocking with said sliding frame, said head shifting member engaging with said eject plate to shift said magnetic head;

an operational member for applying an ejecting force to said eject plate;

an eject spring coupled between said rack member and said operational member so as to store said ejecting force due to the sliding of said rack member, said operational member being adapted to be slidable with said rack member so as to apply the ejecting force stored in said spring to said eject plate, said stored spring energy supplying the sole motive force to said eject plate;

lock means for locking said operational member in a given position corresponding to said recording and reproducing position; and

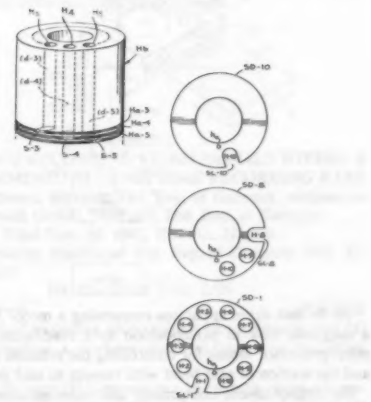
release means for releasing said operation member from said locked condition produced by said lock means.

4,458,277

SPACERS FOR END-WISE PNEUMATIC PARTITIONED DISK PACK

Herbert U. Ragle, Thousand Oaks, and Dean DeMoss, Camarillo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 092,728, Nov. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 049,553, Jun. 18, 1979, abandoned, which is a continuation of Ser. No. 890,799, Mar. 27, 1978, Pat. No. 4,167,029, which is a continuation-in-part of Ser. No. 711,647, Aug. 4, 1976, Pat. No. 4,086,640. This application Aug. 12, 1981, Ser. No. 292,072
Int. Cl.³ G11B 5/016, 25/04
U.S. Cl. 360—99 11 Claims



7. In an improved disk pack adapted for pneumatic partitioning, this pack including an array of conduit means, each conduit means being adapted to direct a partitioning air stream axially and up through the pack to introduce a partitioning gap at the interface between selected disks; this pack including:

spacer means axially adjacent each disk and including radial

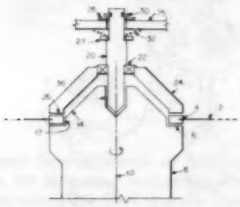
vent means pneumatically communicating with said interface.

4,458,278

DISK-CENTERING MECHANISM FOR USE WITH A HIGH-DENSITY FLEXIBLE DISK

William R. Maclay, Los Gatos, and Laureen V. Merritt, Los Altos, both of Calif., assignors to Datacopy Corporation, Mountainview, Calif.

Filed Apr. 29, 1982, Ser. No. 373,070
Int. Cl.³ G11B *17/02, 25/04*
U.S. Cl. 360—99 **17 Claims**



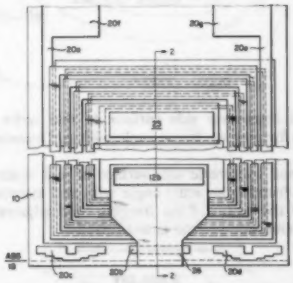
1. A disk centering-and-clamping apparatus comprising:
a spindle (8; 40; 52),
said spindle being shaped so as to receive onto said spindle a disk having a center hole therein,
said spindle including:
a spindle shaft;
said spindle being capable of rotary motion around an axis of rotation (10),
means for centering said disk over said spindle such that said center hole is acurately centered on said spindle, said centering means including means (2) for orienting said disk othogonal to said axis of rotation;
said means for centering said disk on said spindle further including:
a seating surface (6) on said spindle perpendicular to said axis of rotation of said spindle, and,
a cylindrical alignment surface (12) coaxial with said axis of rotation (10) of said spindle,
said cylindrical surface (12) being terminated at one end by said seating surface and at an opposite end by a conical surface (14; 42; 60) which tapers towards said axis of rotation (10);
means for clamping said disk on said spindle such that as said spindle is rotated, said disk rotates with said spindle;
said means for clamping said disk on said spindle further including:
a spindle cap (24; 44; 62),
said spindle cap (24; 44; 62) having a spindle cap shaft (20) such that said spindle cap is capable of rotary motion around said axis of rotation (10),
said spindle cap (24; 44; 62) positioned with respect to said spindle (8; 40; 52) such that said spindle cap may be either engaged with or disengaged from said spindle,
said spindle cap (24) having a clamping surface (26) perpendicular to said axis of rotation (10) for clamping a disk to said seating surface (6) of said spindle (8; 40; 52) when said spindle cap is engaged with said spindle;
said spindle cap having a conical tip (34; 46);
said spindle (8; 40; 52) being provided with an alignment hole (36; 48) in said conical surface (14; 60; 42) of said spindle (8; 40; 52), said alignment hole being adapted to receive said conical tip (34; 46);
moving means for, selectively,
(1) urging said spindle cap and said spindle into disengagement to thereby permit placement of said disk on said spindle, and,
(2) urging said spindle cap and said spindle into engagement with each other to thereby engage said clamping surface (26) on said spindle cap (8; 40; 52) with said seating surface (6) on said spindle to thereby clamp said disk between said clamping surface and said seating surface.

4,458,279

THIN FILM TRANSDUCER AND METHOD OF MAKING SAME

Eric R. Katz, San Jose, Calif., assignor to Magnex Corporation, San Jose, Calif.

Filed Mar. 23, 1981, Ser. No. 246,748
Int. Cl.³ G11B *5/20, 5/12, 5/22, 5/27*
U.S. Cl. 360—123 **13 Claims**



1. In a thin film magnetic transducer assembly of the type characterized by:
a substrate;
a first magnetic pole piece disposed in a first layered configuration relative to a surface of said substrate and having a first end in a pole tip region and a second end in a back gap region;
at least one layer of electrically conductive material disposed in a pattern overlying said first magnetic pole piece; and
a second magnetic pole piece disposed in a second layered configuration overlying at least a portion of said first pole piece and said electrically conductive material, said second pole piece being spaced from said first pole piece in said pole tip region to form a transducing gap of a first length and forming a back gap with said first pole piece in said back gap region; the improvement wherein: said pattern of said conductive material includes first means adjacent said pole tip region for divergently spacing said first and second pole pieces apart by a distance greater than said first length in an apex region adjacent said pole tip region, said first means determining a zero throat height transition region of said first and second pole pieces; and
said pattern further comprises second means outside said first and second pole pieces having optically detectable indicies in predetermined aligned relationship with said first means, said optically detectable indicies extending at least to a target reference line in predetermined aligned relationship with said first end of said first pole piece, and being optically detectable for accurately determining the location of said apex region relative to said first end.

4,458,280

SERVO WRITING TRANSDUCER DESIGN AND WRITING METHOD

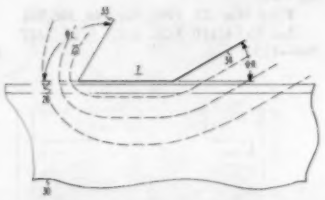
Earl A. Cunningham, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 18, 1982, Ser. No. 339,940
Int. Cl.³ G11B *5/12, 5/22*
U.S. Cl. 360—125 **6 Claims**

1. A servo write head for writing magnetic servo informa-

tion on an associated magnetic media having adjoining, parallel servo track portions,

said write head including spaced pole pieces defining a transducing gap wherein the gap length is the length of the space between the pole pieces at the transducing gap and the gap width is the distance between first and second transverse sides of the confronting pole piece portions that substantially defines the width of the magnetized track as the associated media is moved past the transducing gap,



said first transverse side surface of said write head pole pieces forming an obtuse angle with said associated media, and

said second transverse side surface of said write head pole pieces forming an acute angle with said associated media,

whereby the width of the fringing field adjacent said first transverse side surface is minimized.

4,458,281

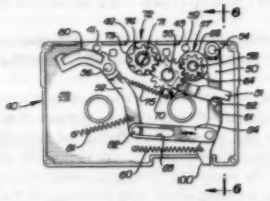
MAGNETIC TAPE HEAD CLEANING APPARATUS

Stephen Kara, 2609 Sapra St., Thousand Oaks, Calif. 91360

Filed Oct. 16, 1981, Ser. No. 311,994

Int. Cl.³ G11B *5/41*

U.S. Cl. 360—128 **10 Claims**



1. An apparatus for cleaning the magnetic tape head of a magnetic tape transport having a driven capstan roller comprising:

(a) a housing having front and bottom walls, the front wall having at least a head aperture adjacent the head of the transport and a capstan opening adjacent the capstan of the transport;

(b) a driven member in the housing, driven member mounting means in the housing for supporting the driven member between two positions, the first position mounting the driven member in contact with the capstan of the transport and the second position mounting the driven member out of contact with the capstan, means for biasing the driven member mounting means toward the first position;

(c) a head cleaning wheel and wheel mounting means in the housing for mounting the wheel adjacent the head, the head mounting means being movable under influence of the head on the wheel between two positions;

(d) blocking means on the wheel mounting means for blocking the movement of the driven member mounting means from the second position to the first position in a first position of the blocking means and releasing the driven member mounting means to its first position when the blocking means is in its second position; and

(e) coupling means extending between the driven member and the head cleaning wheel for rotating the head cleaning wheel when the capstan rotates the driven member.

4,458,282

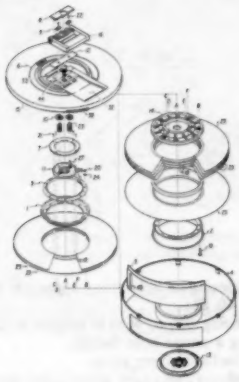
MEDIA MODULE

Paul K. Mui; James H. Smith; Charles C. Woodard, all of Boise, Id., and Laurence J. Albrecht, Seattle, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 26, 1981, Ser. No. 314,912

Int. Cl.³ G11B *23/02*; B65D *85/30*

U.S. Cl. 360—133 **17 Claims**



1. A module for dust-free containment of rotating data storage media and for use in a disc drive, said module comprising:

a top cover, including a hub assembly locking means;

a bottom cover having an annular sidewall extending upwardly from the outer periphery of said bottom cover coupled to the top cover to form a cavity;

a hub assembly including the rotating media and a disc drive coupling means contained within the cavity formed by the top and bottom covers;

a carrying handle having a carrying position normal to the plane of the top cover for lifting and transporting the module and for rotating said module with respect to the disc drive when the module is installed therein and a retracted position parallel to the plane of the top cover; and

a lift plate disposed within a cavity in the upper portion of the hub assembly and coupled through the top cover to the carrying handle for engaging the hub assembly and simultaneously disengaging the disc drive coupling means from the disc drive and lifting the hub assembly into engagement with the hub assembly locking means when the carrying handle is pivoted to its carrying position.

4,458,283

STATIC PROTECTIVE RELAY

Takashi Iida, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 139,638, Apr. 14, 1980, abandoned. This application Apr. 9, 1982, Ser. No. 367,007

Claims priority, application Japan, Apr. 18, 1979, 54-46618

Int. Cl.³ H02H *3/253*

U.S. Cl. 361—76 **3 Claims**

1. A static protective relay comprising:

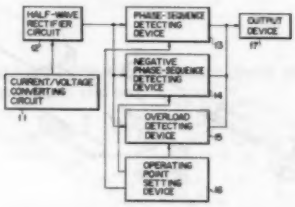
phase current detecting means including plural current transformers inserted in respective poly-phase AC power lines for producing respective voltages proportional to phase currents of respective of said AC power lines;

half-wave rectifying means for rectifying the voltages ob-

tained from each said current transformer to produce respective rectified voltages having a predetermined relative phase relationship; and

negative phase sequence detecting means coupled to said rectifying means for processing the rectified voltages, including

a wave shaping circuit including means for generating trigger outputs in response to given portions of said voltages



delivered from respective of said current transformers, means for generating rectangular wave outputs having predetermined widths in response to said trigger outputs, and first and second logic gates to which said rectified voltages and rectangular wave outputs are applied, and

means for detecting that one of the rectified voltages is at a predetermined voltage level when a selected other of said rectified voltages transits from a first voltage level to a second voltage level.

4,458,284

METHOD FOR ELECTRICAL AND THERMAL PROTECTION OF OUTPUT DEVICES OF ELECTRONIC AMPLIFIERS

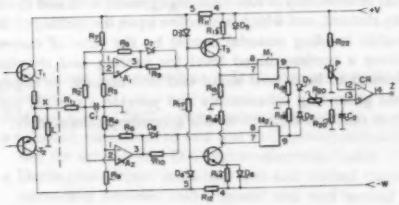
Matti N. Otala, Oulu, Finland, assignor to Shin-Shirasuna Electric Corp., Nagoya, Japan

Filed May 3, 1982, Ser. No. 374,411

Claims priority, application Japan, Jun. 12, 1981, 56-90261

Int. Cl.³ H02H *3/28, 7/20*

U.S. Cl. 361—79 **5 Claims**



1. An apparatus for protecting the output devices of an electronic amplifier having means for connecting a signal, load or supply voltge to said amplifier, from excess power dissipation, comprising:

means adapted to yield instantaneous voltages across said output devices;

means adapted to yield instantaneous currents through said output devices;

means for multiplying said voltages and currents into a signal product;

means including a temperature-sensitive element for thermal weighing said multiplied signal products;

means for temporal weighing of said multiplied signal products;

means for comparing said thermally and temporally weighed multiplied signal products with an adjustable protection reference; and

means for activating a member to disconnect said connecting means from said amplifier to be protected.

4,458,285

METHOD AND DEVICE FOR FINDING FAULTS ON ELECTRIC LINES BY THE PRINCIPLE OF LOW IMPEDANCE

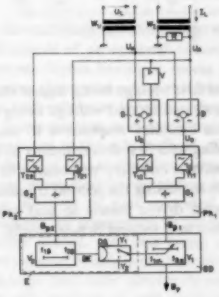
Ivan De Mesmaeker, Windisch, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 20, 1982, Ser. No. 420,286

Claims priority, application Switzerland, Sep. 22, 1981, 6094/81

Int. Cl.³ H02H *7/26*

U.S. Cl. 361—79 **9 Claims**



1. A method for detecting faults on an electric line, using the principle of low impedance, comprising the steps of:

deriving an image voltage signal and a line voltage signal which are respectively proportional to the current and the voltage in an electric line being tested for faults;

generating a difference voltage signal based on the difference between said image voltage signal and said line voltage signal;

generating a sum voltage signal from said image voltage signal and said line voltage signal;

determining a first phase difference between said difference voltage signal and said sum voltage signal;

determining a second phase difference between said image voltage signal and said line voltage signal;

determining whether said second phase difference lies within a predetermined range of phase angle values;

comparing said first phase difference to a first limit value when said second phase difference lies within said range and comparing said first phase difference to a second limit value when said second phase difference lies outside said range; and

generating a fault signal if the first phase difference exceeds the limit value to which it is compared.

4,458,286

ELECTRONIC DEVICE HAVING A HIGH VOLTAGE BREAKDOWN PROTECTION CIRCUIT

Eiichi Matsumura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1982, Ser. No. 413,206

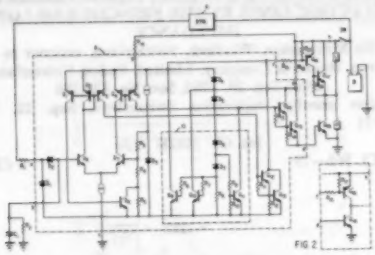
Claims priority, application Japan, Aug. 31, 1981, 56-129335

Int. Cl.³ H02H *3/20*

U.S. Cl. 361—91 **21 Claims**

1. An electronic device comprising a power terminal for receiving a predetermined voltage, a reference potential terminal, first and second loads connected in series between said power source terminal and said reference potential terminal, first and second transistors connected in series to drive said

first and second loads, respectively, first driver means for conducting a first transistor drive current in response to which said first transistor is turned on and second driver means for conducting a second transistor drive current in response to which said second transistor is turned on, a voltage detecting circuit for detecting first and second voltages at said power source terminal to produce first and second detection outputs,



respectively, said first voltage being higher than said predetermined voltage and said second voltage being higher than said first voltage, first circuitry responsive to said first detection output for disabling said first driver means to turn off said first transistor, and second circuitry responsive to said second detection output for bypassing the second transistor drive current around said second driver means to said reference potential terminal to protect said second driver means.

4,458,287

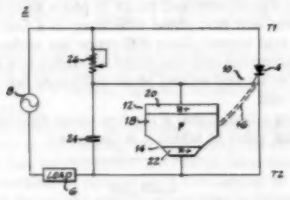
THERMALLY PROTECTED SEMICONDUCTOR WITH ACCURATE PHASE CONTROL

Stanley V. Jaskolski, Sussex, Wis.; Robert W. Lade, Fort Myers, Fla.; Herman P. Schutten, Milwaukee, and Gordon B. Spellman, Mequon, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 23, 1982, Ser. No. 421,940

Int. Cl.³ H02H *5/04*

U.S. Cl. 361—103 **12 Claims**



1. A semiconductor switch comprising:

a power thyrsitor having first and second main terminals for carrying load current and a gate for controlling the conduction state thereof; and

first and second antiseries back to back diode junctions thermally coupled to said thyristor and electrically connected between said thyristor gate and said second main terminal, said diode junctions being of semiconductor material having lower energy band gap than the semiconductor material of said thyristor, said diode junctions having nonsymmetrical leakage currents.

4,458,288

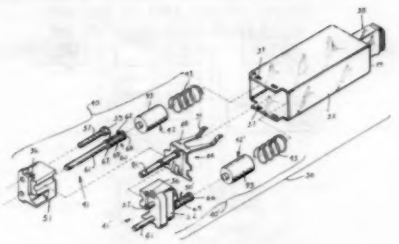
ELECTRICAL PROTECTIVE DEVICES

John L. Chapman, Jr., Catonsville; Thomas A. La Valle, Annapolis, and Peter S. Nelson, Severna Park, all of Md., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed May 28, 1982, Ser. No. 383,385

Int. Cl.³ H02H *9/06*

U.S. Cl. 361—124 **25 Claims**



1. An electrical protector assembly for protectng a circuit against excessive current increases and excessive voltage surges, said protector assembly comprising:

a dielectric housing for supporting the assembly;

a grounding subassembly for grounding said protector assembly when excessive voltage surges and excessive current increases occur in the circuit;

a voltage protection subassembly connected electrically to said grounding subassembly;

a current protection subassembly including a dielectric base for supporting first and second electrically conductive elements and a shunting element which are connected together to establish electrical contact between the circuit and said protector assembly, said shunting element being aligned axially with said first element which extends through said base and releasably secured thereto by a fusible bonding material; and

means interposed between said voltage protection subassembly and said housing for maintaining said voltage protection subassembly in electrical engagement with said shunting element, and which is effective upon the melting of the fusible bonding material caused by the flow of current above a predetermined level for causing said shunting element to be moved along said first element to engage said grounding subassembly and provide a current path from said first element to said grounding subassembly.

4,458,289

SOLENOID DRIVE FOR VALVES

Wolfgang Lukasczyk, Lohr, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Filed Nov. 22, 1982, Ser. No. 443,624

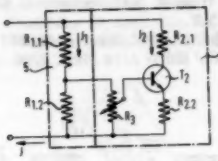
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1981, 3147559

Int. Cl.³ H01H *47/00*

U.S. Cl. 361—139 **7 Claims**

1. A solenoid for valves, comprising an electrical coil and an armature of which the actuating force is proportional to the electrical input signal being supplied to the coil, and further

comprising an alignment means to finely adjusting the actuating force of said armature, characterized in that the alignment



means comprises an electrical resistance circuit which is connected in parallel to said coil.

4,458,290

CIRCUIT FOR CONTROLLING A D.C. ELECTROMAGNETIC BRAKE

Hideo Miyashita, Hino, Japan, assignor to Fujitsu Fanuc Limited, Tokyo, Japan

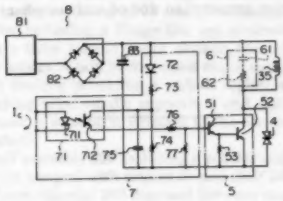
PCT No. PCT/JP81/00282, § 371 Date Jun. 8, 1982, § 102(e) Date Jun. 8, 1982, PCT Pub. No. WO82/01450, PCT Pub. Date Apr. 29, 1982

PCT Filed Oct. 14, 1981, Ser. No. 387,882

Claims priority, application Japan, Oct. 14, 1980, 55-142358

Int. Cl.³ H01H *47/32*

U.S. Cl. 361—152 **1 Claim**



1. A circuit for controlling a D.C. electromagnetic brake comprising:

first and second D.C. power source terminals;

a solenoid, connected to said first D.C. power source terminal, for driving said D.C. electromagnetic brake;

a Darlington circuit, including first and second transistors connected between said solenoid and said second D.C. power source terminal for controlling the current flowing through said solenoid;

a varistor connected in parallel to said second transistor of said Darlington circuit;

a driver circuit, connected between said first and second D.C. terminals, for driving said Darlington circuit, said driver circuit comprising a series circuit formed by a diode, and first and second resistors, and comprising a capacitor connected in parallel to said second resistor;

a photocoupler connected to the connection point of said first and second resistors of said driver circuit and to said first transistor of said Darlington circuit, for receiving a drive command signal to turn on said Darlington circuit; and

a noise suppressor circuit, connected in parallel to said solenoid, said noise suppressor circuit comprising a capacitor and a third resistor connected in series.

4,458,291

PACKAGE FOR ENCLOSING SEMICONDUCTOR ELEMENTS

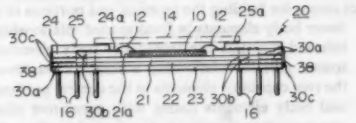
Mamoru Yanagisawa; Hidehiko Akasaki, both of Kawasaki, and Hideji Aoki, Machida, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 20, 1982, Ser. No. 400,035

Claims priority, application Japan, Jul. 22, 1981, 56-114724

Int. Cl.³ H05K *7/06*

U.S. Cl. 361—212 **7 Claims**



1. A package for enclosing semiconductor elements and for connection to terminals of an external circuit, comprising: a plurality of substrate layers having a recess portion formed therein for mounting the semiconductor elements; conductive wires formed in said substrate layers, having inner patterns exposed in said recess portion, and extending in said package from said inner patterns to the side surfaces of said package so that the cross sections of said conductive wires are exposed for receiving a voltage when electrolytic plating is effected to said inner patterns; a plurality of pins provided on the bottom surface of the package for connection to corresponding terminals of the external circuit, said pins being electrically connected to the semiconductor elements through said conductive wires in said package; and static electricity-preventing means provided at said side surfaces of said package as an integral part of said package for preventing a high voltage due to static electricity from being applied to said cross-sections of said conductive wires after the electrolytic plating is effected.

4,458,292

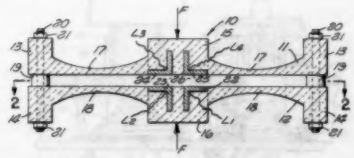
MULTIPLE CAPACITOR TRANSDUCER

Emanuel Tward, Northridge, and Philip D. Junkins, West Los Angeles, both of Calif., assignors to Tward 2001 Limited, Los Angeles, Calif.

Filed Jul. 22, 1982, Ser. No. 400,725

Int. Cl.³ H01G *7/00*

U.S. Cl. 361—283 **7 Claims**



1. A capacitive type pressure or displacement sensing transducer comprising:

(a) two elongated transducer body elements formed of dielectric material and positioned in spaced parallel relationship, each of said body elements having a central portion and terminal end portions and at least one of said body elements being capable of deflection upon the application of an external pressure force to its central portion;

(b) four electrically conductive capacitor elements each formed to present two angularly disposed and electrically connected capacitive plates with two of said capacitor elements mounted in fixed spaced relationship from one another in the central portion of each of said transducer body elements and positioned therein so that each capacitive plate thereof defines with a capacitive plate of the

next adjacent capacitor element a dielectric space therebetween whereby said mounted capacitor elements together form four dielectric spaces, a first pair of said dielectric spaces being comprised of the like dielectric space located within each central portion of each transducer body element between capacitive plates of the capacitor elements mounted therein and said first pair of like dielectric spaces containing the dielectric material of said transducer body elements thereby forming with their respective space defining capacitive plates two capacitors of like fixed electrical capacitive value; and

(c) means for holding the terminal end portions of said transducer body elements in fixed spaced relationship to establish and maintain the transducer body elements in their spaced parallel relationship whereby capacitive plates of the two capacitor elements in the central portion of one of said body elements define with capacitive plates of the two capacitor elements in the central portion of the other of said body elements a second pair of said dielectric spaces comprised of like open dielectric space located between said body elements, said second pair of like open dielectric spaces forming with their respective space defining capacitive plates two capacitors of like variable electrical capacitive value, the application of an external pressure force to the central portion of said transducer body elements causing deflection of at least one of said elements and a change in the spacing distance between the central portions of said body elements thereby varying the electrical capacitive value of said variable value capacitors in direct relationship to the force value of said pressure force.

4,458,293

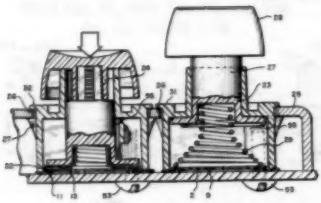
CAPACITIVE KEYBOARD

Walter L. Cherry, Winnetka, Ill., assignor to Cherry Electrical Products Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 318,483, Nov. 5, 1981, abandoned. This application May 17, 1982, Ser. No. 379,059

Int. Cl.³ H01G *5/14*; B41J *5/08*

U.S. Cl. 361—288 **17 Claims**



15. A capacitive switch, comprising:

at least one conducting plate;

an insulating dielectric sheet means disposed over said at least one conducting plate;

an electrically conducting coiled spring;

means for compressing said spring adjacent to said at least on conducting plate to define a predetermined activated switch capacitance and for releasing said spring to define a distinguishable inactivated switch capacitance; and

means for supporting said spring means in spaced relation to said at least one conducting plate for maximizing the difference between said activated switch capacitance and inactivated switch capacitance.

4,458,294

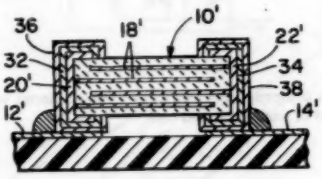
COMPLIANT TERMINATION FOR CERAMIC CHIP CAPACITORS

Billy B. Womack, Wendell, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 28, 1982, Ser. No. 402,553

Int. Cl.³ H01G *1/14*; H01C *7/00*

U.S. Cl. 361—321 **9 Claims**



7. A monolithic chip capacitor which is adapted to be connected directly to conductive lands of a circuit board without the use of lead wires, said capacitor comprising

a multilayer dielectric capacitor body formed of stacked, alternately arranged layers of dielectric material and metallic electrode material, alternate electrode layers extending to opposite endfaces of the body,

a noncompliant metalized layer on each of said opposite endfaces electrically contacting the electrode layers extending thereto,

a coating of compliant, conductive material over the entire surface of each of said noncompliant metalized layers, and

a metallic layer disposed over the entire surface of each of said compliant coatings, the melting point of the metallic layers being greater than that of said compliant coating.

4,458,295

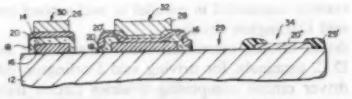
LUMPED PASSIVE COMPONENTS AND METHOD OF MANUFACTURE

Mark S. Durschlag, Natick, and James L. Vorhaus, Newton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 9, 1982, Ser. No. 440,479

Int. Cl.³ H01G *4/10*, *7/00*; H01L *27/02*

U.S. Cl. 361—322 **14 Claims**



8. A capacitor formed in a substrate comprising:

a first metal contact disposed over the substrate;

a region of an insulating material disposed over peripheral edge portions of the first metal contact;

a layer of a valve metal disposed over the insulating region and the first contact;

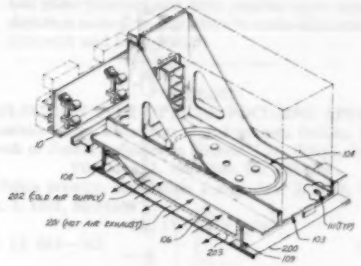
a layer of an oxide of the valve metal on the layer of the valve metal; and

a second metal contact disposed over the valve metal oxide.

4,458,296
AVIONIC SHELF ASSEMBLY

Richard M. Bryant, Woodinville; Henry P. Clemen, Jr., Bellevue, and William H. Weaver, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 19, 1982, Ser. No. 379,583
Int. Cl.³ H02B *1/04;* H05K *7/20*
U.S. Cl. 361—383 2 Claims



1. In combination in an avionic shelf assembly **200** for aircraft avionics:

one of a plurality of differently dimensioned avionics trays mounted on said shelf assembly;

a plurality of rails **108**, **109**, each of said rails having mounting holes **110** and slots corresponding to mounting hole locations of said one of a plurality of differently dimensioned avionics trays **103**, **105–107** thereby permitting said avionic shelf assembly **200** to receive said one of a plurality of differently dimensioned avionics trays **103**, **105–107**;

a track **10** or **11** forming the rear of said shelf assembly **200**, said track **10** or **11** including supporting means supporting a plurality of terminal modules **12** disposed along a rear first major surface area **21** and **22** of said track, said track further including a flange-like leg structure **8** extending from a front second major surface area of said track at right angles to said front second major surface area of said track thereby providing a surface region with means for attaching wire bundle supports **6** and further providing increase in structural strength to the fore-aft direction of the shelf;

said shelf assembly **200** including a hot **201** and a cold **202** air plenum integral with respect to said shelf **200** with insulating foam material **203** disposed between said hot and cold air plenum portions of said shelf;

and,

said cold air plenum **202** including a metering plate **2** having a seal **6** and orifice assembly **104** connected therewith, said seal **6** having an adjustable lip **4** providing an air tight seal between said metering plate **2** and said one of a plurality of differently dimensioned electronics trays **103**, **105–107**.

4,458,297
UNIVERSAL INTERCONNECTION SUBSTRATE

Herbert Stopper, Orchard Lake, and Richard A. Flasck, Rochester, both of Mich., assignors to Mosaic Systems, Inc., Del. and Burroughs Corporation, Mich.

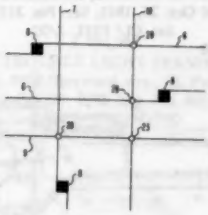
Continuation of Ser. No. 225,581, Jan. 16, 1981, abandoned. This application Nov. 29, 1982, Ser. No. 445,156
Int. Cl.³ H05K *1/18*
U.S. Cl. 361—403 20 Claims

1. A substrate for integrated circuitry comprising a base substrate wafer adapted for integrated circuit processing having disposed thereon a first conductive interconnection layer of lines and a second conductive interconnection layer of lines and a layer of insulation separating said first and second interconnection layers,

said base substrate being adapted for carrying a plurality of integrated circuit chips thereon, and

said first and second interconnection layers being adapted to provide a passive bi-directional routing network capable of handling many independent and concurrent signals between said integrated circuit chips which are to be mounted on said substrate by a discretionary pattern of interconnection lines,

said first and second interconnection layers being interconnected after fabrication of the substrate at discretionary cross-points through said insulating layer, each of which discretionary cross-points connects a line in said first interconnection layer with a line in said second interconnection layer to complete and fix the discretionary pattern of interconnection lines,

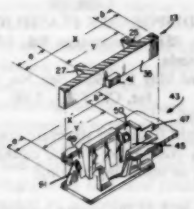


each of said discretionary cross-points being formed by the application of a first potential to a single first line of said first interconnection layer and a second different potential to a single second line of said second interconnection layer which crosses said single first line at a selected discretionary cross-point, whereby the selected discretionary cross-point is created as a bi-directional conductive via by altering the state of the insulation at the cross-point from a dielectric state to a conductive state to set an interconnection between said single first line and said single second line at the selected discretionary cross-point to form at least a part of said discretionary pattern of interconnection lines for said integrated circuit chips.

4,458,298
PHOTOFLASH ARRAY INTERFACE TAB

Donald W. Hartman, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Nov. 3, 1982, Ser. No. 438,689
Int. Cl.³ G03B *15/02*
U.S. Cl. 362—15 9 Claims



1. A miniaturized multilamp photoflash array comprising: a light transmittable plastic cover member;

a plastic reflector member positioned within said cover member and having a plurality of lamp-receiving cavities and a pair of spaced outwardly extending leg members formed for engagement within a receiving socket;

a flashlamp positioned within each of said lamp-receiving cavities of said reflection member; and

a planar support platform having a surface attached to said reflector members with a printed circuit thereon electri-

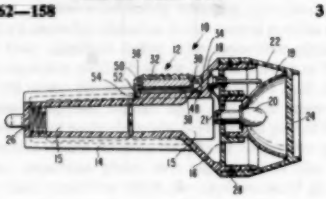
cally connected to said flashlamps and an outwardly extending planar tab portion of a width greater than the width of said spaced outwardly extending leg members and formed for insertion into and withdrawal from a receiving socket having a pulse potential source therein, said tab portion having circuit means thereon for coupling said potential source to said printed circuit.

4,458,299

MAGNETIC SWITCH

Arthur W. Stephens, Bordentown City, and John J. Penrose, Bordentown Township, Burlington County, both of N.J., assignors to Princeton Tectonics, Bordentown City, N.J.

Filed Oct. 26, 1981, Ser. No. 315,353
Int. Cl.³ F21L 7/00
U.S. Cl. 362—158 **3 Claims**



1. A hermetically sealed flashlight comprising:
(a1) a mercury wetted magnetic switch;
(a2) a housing for a slideable magnet holder, said housing being adjacent to said mercury wetted magnetic switch;
(a3) a slideable magnet holder in said housing, said magnet holder holding a magnet;
(a4) means for retaining said slideable magnet holder within said housing while permitting said magnet holder within said housing while permitting said magnet holder to slide into a first position within said housing whereby the mercury wetted magnetic switch will close and a second position within said housing whereby the mercury wetted magnetic switch will open;
(b) a case for holding electric power cells, said case including a housing for the slideable portion of said switch;
(c) means for holding said mercury wetted magnetic switch adjacent to said housing;
(d) means for holding a light bulb in contact with said power cells; and
(e) means for hermetically sealing said case.

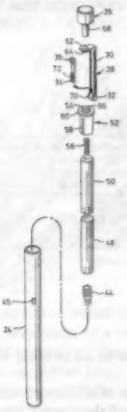
4,458,300

DISPOSABLE FLASHLIGHT

David J. Walsh, 2512 Mississauga Rd., Mississauga, Ontario, L5H 2L5, Canada

Filed May 17, 1982, Ser. No. 378,543
Int. Cl.³ F21L 7/00
U.S. Cl. 362—206 **4 Claims**

1. A lightweight flashlight structure comprising:
an electrically conductive tubular casing open at both ends and having an insulating coating;
a bulb;
means at one end of the casing locating and retaining the bulb with the glass portion of the bulb exposed, this means electrically connecting the bulb to the casing;
energy means having two poles and contained in the casing for activating the bulb, the energy means having one of the poles coupled electrically to the bulb so that the casing is coupled electrically to said one of the poles through the element of the bulb;
a tubular insulator firmly engaged in the other end of the casing;
an electrically conductive spring contained in the insulator and in engagement with the other of the battery poles;
an electrically conductive end cap having a portion in frictional engagement with the insulator and in electrical contact with the spring;
an electrically conductive clip assembly having a portion trapped between the insulator and the end cap, a arm projecting alongside the casing, the arm terminating at its



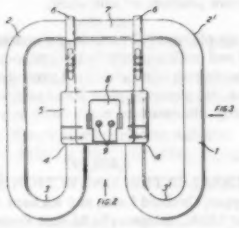
distal end in an end piece, and an insulating fulcrum piece coupled to the arm and having a part in engagement with the casing so that the end piece is adjacent to but separated from the casing whereby upon squeezing the end piece into engagement with the casing the bulb lights.

4,458,301

DISCHARGE LAMPS WITH CURVED SECTIONS AND CENTRAL CONNECTIONS

John M. Chapman, Petersfield, and Basil Antonis, London, both of England, assignors to THORN EMI plc, London, England

Filed Jan. 25, 1982, Ser. No. 342,343
Claims priority, application United Kingdom, Jan. 27, 1981, 8102508; Mar. 31, 1981, 8109947
Int. Cl.³ F21S 5/00
U.S. Cl. 362—216 **23 Claims**



1. A fluorescent lamp, adapted to co-operate with a lamp holder in the manner of a general lighting service filament lamp, comprising:
a discharge tube having tube ends and an electrode disposed at each tube end, a lamp support housing fixed to said tube, external electrical connection means carried by said lamp support housing, and internal electrical connection means connecting the external electrical connection means to the tube, wherein:
the discharge tube is disposed substantially in a plane and shaped at least in part to define a substantial part of the boundary of a zone in the plane, the part of the tube defining the boundary including at least one straight portion,

the lamp support housing lying in a central part of said zone and the ends of the tube being re-entrant into said central part of said zone such that the ends of the tube are received within the lamp support housing and wherein the external electrical connection means comprises a terminal lying within said central part of said zone to co-operate with said lampholder and facing in a direction normal to said plane whereby said lamp requires to be urged in said direction normal to said plane to make electrical connection with said lamp holder.

4,458,302

REFLECTION TYPE OPTICAL FOCUSING APPARATUS

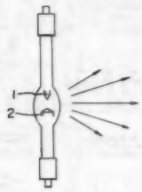
Masataka Shiba, Yokohama, and Yoshitada Oshida, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 2, 1982, Ser. No. 384,679

Claims priority, application Japan, Jun. 3, 1981, 56-84342; Jun. 3, 1981, 56-84349

Int. Cl.³ F21V *7/00*

U.S. Cl. 362—303 **14 Claims**



1. A reflection-type optical focusing apparatus comprising a 4th-degree surface reflector with its cross-section, on a plane including a revolving symmetric axis, forming a part of an ellipse with its major axis having a certain inclination with respect to said revolving symmetric axis, a virtual point source being located at one focal point of said ellipse so that a light image in the shape of an arc band is produced.

4,458,303

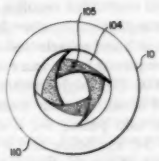
LIGHT BEAM CONCENTRATING, INTENSIFYING AND FILTERING DEVICE

Michael S. Berns, 18 E. Old Willow Rd., Suite 220N, Prospect Heights, Ill. 60070

Filed May 24, 1982, Ser. No. 381,576

Int. Cl.³ F21V *17/02*

U.S. Cl. 362—321 **14 Claims**



1. A light beam concentrating, intensifying and filtering device for use in combination with a parallel ray light beam source comprising:

a frame with a aperture therein;

a plurality of curved shutter leaves disposed around the circumference of said frame, each said leaf being pivotally connected at one end to said frame and pivotally and slidably connected at the other end to a rotatable ring mounted on said frame co-axial with the center of said aperture; said ring, when rotated, causing said leaves to open or close said aperture;

wherein each of said leaves is comprised in part of transparent material and in part of opaque material, such that when said aperture is substantially closed by said leaves, the transparent portions of the said leaves are disposed in the central portion of said aperture and the opaque portions of said leaves are disposed in the remaining portion of said aperture.

4,458,304

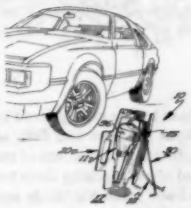
TROUBLE LIGHT STAND

Allan J. Imsdahl, 1604 Sherwood Ave., St. Paul, Minn. 55106

Filed Jan. 27, 1983, Ser. No. 461,677

Int. Cl.³ F21V *21/00*

U.S. Cl. 362—387 **9 Claims**



1. A trouble light support and storage device capable of retaining a trouble light having an electrical cord, an electrical cord plug and a mounting hook for holding a trouble light in an upright position relative to a working surface comprising:

a frame of substantially elastically flexible material and including first and second transverse web members and a third web member being perpendicular and adjacent to said first and second transverse web members and having a pair of recessed grooves, said frame also including a trouble light receiving aperture formed in said frame, said trouble light receiving aperture capable of receiving the trouble light and encompassing the trouble light to protect it from damage;

said first web member including means for preventing lateral slippage of the mounting hook relative to said first web member;

said second web member including trouble light cord retaining means for retaining the cord in a predetermined position relative to said second web member;

said means for preventing lateral slippage and said cord retaining means cooperating to tensionally retain the trouble light in said aperture within said frame when the hook is engaged with said means for preventing lateral slippage and the cord is engaged by said cord retaining means, so that light is directed in a predetermined direction and vibration and slippage of the trouble light are inhibited;

said third web member including primary and secondary cord storage reels;

said primary storage reel including a pair of recessed slots with one of said slots being adjacent said first web member and the remaining slot adjacent said second web member to receive and retain the electrical cord in said slots; and

said secondary cord reel including said pair of recessed grooves so that the cord adjacent the electrical cord plug is retained by said secondary cord reel with the electrical plug positioned through said recessed grooves to retain the cord plug during transportation and permit easy winding.

4,458,305

MULTI-PHASE TRANSISTOR/DIODE BRIDGE CIRCUIT

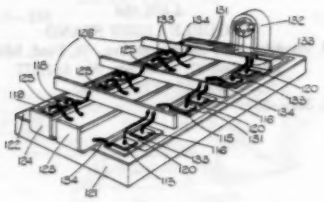
Allan S. Buckle, Kenilworth, and Philip W. Allso, Solihull, both of England, assignors to Lucas Industries plc, Birmingham, England

Filed May 12, 1982, Ser. No. 377,422

Claims priority, application United Kingdom, May 12, 1981, 8114521

Int. Cl.³ H02M 7/537

U.S. Cl. 363—141 1 Claim



1. A three-phase bridge arrangement including positive and negative d.c. input bus bars and first, second and third a.c. output bus bars, first and second sets of transistor/diode assemblies, each of said sets comprising three transistor/diode assemblies and each of said transistor/diode assemblies comprising a bipolar n-p-n transistor, and a diode which is electrically connected in reverse conduction mode across the current carrying zones of the transistor, each of the transistor/diode assemblies of said first set of assemblies having the cathode zone of its diode and the interconnected zone of its transistor electrically connected to said positive d.c. input bus bar and the anode zone of its diode and the interconnected zone of its transistor electrically connected to a respective one of said first, second and third a.c. output bus bars, each of said transistor/diode assemblies of said second set of assemblies having the anode zone of its diode and the interconnected zone of its transistor electrically connected to said negative d.c. input bus bar, and the cathode zone of its diode and the interconnected zone of its transistor electrically connected to a respective one of said first, second and third a.c. output bus bars, the bridge arrangement further including an input terminal having a plurality of electrical contacts each being electrically connected to the control zone of the transistor of a respective one of said transistor/diode assemblies, and a heat sink having an electrically insulating layer on one major surface thereof and in thermal contact therewith, the collector zone of each transistor of the first set of transistor/diode assemblies being in thermal contact with said heat sink by way of a respective one of three positive d.c. input bus bar extension pieces, which extension pieces are electrically connected with said positive d.c. input bus bar by way of respective flexible stranded connectors, the collector zone of each transistor of said second set of transistor/diode assemblies being in thermal contact with said heat sink by way of respective a.c. bus bar extension pieces each of which a.c. bus bar extension pieces is electrically connected with its respective first, second or third a.c. output bus bar by way of a respective flexible stranded connector, said electrical connection between said first, second and third a.c. output bus bars, and the respective anode and interconnected zones of the respective assemblies of the first set of transistor/diode assemblies being made by way of respective flexible stranded connectors, and, said electrical connections between said negative d.c. input bus bar and the anode and interconnected zones of the assemblies of the second set of transistor/diode assemblies being made by way of respective flexible stranded connectors.

4,458,306

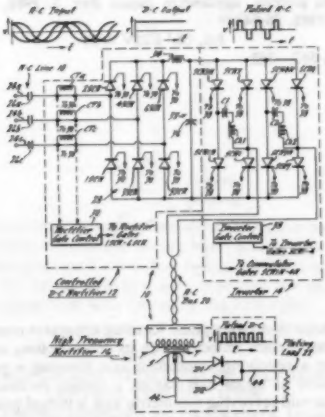
HIGH AMPLITUDE, PULSED CURRENT PLATING SYSTEM

James H. Galloway, New Baltimore, Mich., and Carmelo J. Amato, Cupertino, Calif., assignors to Hooker Chemicals & Plastics Corporation, Warren, Mich.

Filed Apr. 8, 1982, Ser. No. 366,641

Int. Cl.³ H02M 3/315; H02P 13/18

U.S. Cl. 363—27 10 Claims



1. In an industrial plating system providing from a relatively high voltage, 60 Hz, three phase a-c source a relatively low voltage pulsed d-c delivering a current having an amplitude in excess of around 1,000 amperes to a plating load, the invention comprising: controlled rectifier means electrically connected to the a-c source for providing therefrom a rectified d-c output voltage of a preselected high amplitude, inverter means electrically connected to said controlled rectifier means and situated at substantially the same physical location for providing pulsed a-c of a preselected width and preselected a-c frequency, with said preselected a-c frequency being in a range of from around 300 HZ to around 3000 HZ, high frequency rectifier means electrically connected to said inverter means for providing to the plating load from said pulsed a-c a rectified pulsed d-c having a preselected d-c amplitude and a preselected pulsed d-c frequency, said pulsed d-c frequency being twice that of said preselected a-c frequency, said high frequency rectifier means comprising a high frequency step down power transformer and a pair of high speed diodes such that in a plating system where said pulsed a-c has a peak amplitude in a range of from around 150 volts to around 550 volts said power transformer and said high speed diodes provide said pulsed d-c having an amplitude in a range of from around 2 volts to around 50 volts, an a-c bus having lines of opposite polarity electrically transmitting said pulsed a-c to the input of said high frequency rectifier means with said a-c bus being of a gauge permitting twisting of said lines of opposite polarity whereby the inductive and resistive effects of said a-c bus can be minimized.

4,458,307

DATA PROCESSOR SYSTEM INCLUDING DATA-SAVE CONTROLLER FOR PROTECTION AGAINST LOSS OF VOLATILE MEMORY INFORMATION DURING POWER FAILURE

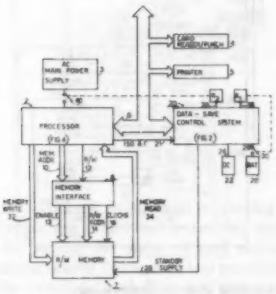
James C. McAnlis, Bangor, Northern Ireland; Kuldip Kumar, Gateshead, England, and Robert T. M. Gould, Downington, Pa., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 944,481, Sep. 20, 1978, abandoned. This application Jan. 17, 1980, Ser. No. 112,976

Claims priority, application United Kingdom, Sep. 22, 1977, 39465/77

Int. Cl.³ G06F *1/00, 13/00*

U.S. Cl. 364—200 **6 Claims**



1. A data processing system comprising:

a processor with volatile registers;

a data memory;

an AC power source;

a detector for monitoring said AC power source for failure, and for providing to said processor a first indication of failure when said AC power source falls below a predetermined voltage, a second indication whenever said failure has endured for longer than a first predetermined period, and a third indication of restoration of said AC power whenever said AC power source exceeds said predetermined voltage for longer than a second predetermined period;

a power supply receiving energy from said AC power source for delivering power to said system during normal operation, said power supply storing sufficient energy in its internal components to continue to deliver power subsequently to said first indication of failure for said first predetermined period and for a third predetermined period for data transfer;

said processor responding to said first indication of failure to perform the following functions constituting a data save operation during said first predetermined period, a data save indication being provided when said functions are successfully completed, said functions including:

(a) completion or reinitialization of the current processor task in preparation for recommencement of operation, said reinitialization including returning said volatile registers used for said current processor task to the same state as at the beginning of said current processor task;

(b) selecting tasks for recommencement of operation according to priority by checking each task beginning with the highest priority task to ascertain if sufficient time remains to complete the task during said first predetermined period, and performing those tasks able to be completed during said first predetermined period;

(c) and upon subsequent receipt of said second indication and during said third predetermined period for data transfer, transfering the contents of said volatile registers to predetermined locations within said data memory, and storing a data save indication in said data memory only when said data save operation is successfully completed, said processor returning to its condition prior to said first indication of failure and resuming said current task if said second indication is not received at the end of said first predetermined period;

an energy store responding to the presence of said data save indication for supplying said data memory with power during said failure, said data memory being a volatile memory; and,

said processor, upon receipt of said third indication, recovering from said failure by retrieving said contents of said volatile registers from said data memory and restoring them to said volatile registers.

4,458,308

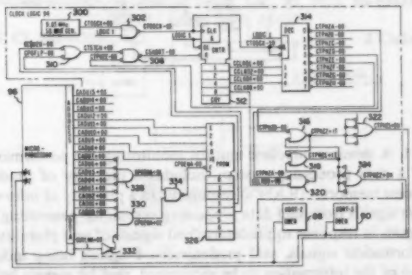
MICROPROCESSOR CONTROLLED COMMUNICATIONS CONTROLLER HAVING A STRETCHED CLOCK CYCLE

Thomas O. Holtey, Newton, Mass.; Richard P. Kelly, Nashua, N.H., and Steven S. Noyes, Boylston; Daniel G. Peters, Billerica, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 6, 1980, Ser. No. 194,540

Int. Cl.³ G06F *3/04, 5/06*

U.S. Cl. 364—200 **4 Claims**



1. In combination with a communications subsystem comprising a controller bus, a communications controller coupled to said controller bus, a plurality of Flexible Line Adapters (FLAPs) coupled to said controller bus, a U bus coupled to said controller bus, at least on Universal Synchronous Receiver Transmitter device (USRT) coupled to said U bus for synchronously transmitting and receiving messages, a random access memory (RAM) coupled to said U bus for storing information and a microprocessor coupled to said U bus, said microprocessor operative to control said RAM at a first clock rate and also operative to control said USRT and said plurality of FLAPs at a second clock rate, clocking logic coupled to said U bus for supplying said first and second clock rates comprising:

(a) a binary counter for generating counter signals;

(b) a freerunning clock coupled to said binary counter for providing freerunning clock signals to advance said binary counter;

(c) a decoder coupled to said binary counter for decoding the counter signals;

(d) logic gates coupled to said decoder responsive to decoded counter signals for generating first and second phase timing signals; and

(e) first means coupled to said microprocessor for indicating that one of said plurality of FLAPs or said USRT are operative with said microprocessor; and,

(f) inhibiting means coupled to said decoder and said binary counter and responsive to one of the decoded counter signals for resetting said binary counter resulting in said first and said second phase timing signals being applied to said microprocessor at said first clock rate, said inhibiting means being further coupled to said first means and re-

sponsive to signals indicative of said microprocessor communicating with said USRT or said one of said plurality of FLAPs for preventing said binary counter from resetting, resulting in said clocking logic supplying said first and said second phase timing signals to said microprocessor at said second clock rate.

4,458,309

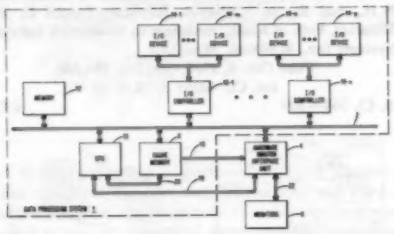
APPARATUS FOR LOADING PROGRAMMABLE HIT MATRICES USED IN A HARDWARE MONITORING INTERFACE UNIT

Richard P. Wilder, Jr., North Billerica, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 1, 1981, Ser. No. 307,569

Int. Cl.³ G06F *11/30*

U.S. Cl. 364—200 **7 Claims**



1. A monitor interface unit for monitoring the performance of a data processing system includes a plurality of random access memories (RAM's) responsive to a plurality of information signals from said data processing system for generating hit signals in response to predetermined signals of said plurality of information signals, said predetermined signals being indicative of the information to be monitored, said hit signals being representative of said RAM's storing binary ONE bits in predetermined locations of said RAM's which are addressed by said predetermined signals, apparatus for loading said binary ONE bits in said RAM locations comprising:

cycle selection means responsive to a first of said plurality of information signals in a first state for generating an address cycle signal during a first cycle of operation of said data processing system and responsive to said first of said plurality of information signals in a second state for generating a data cycle signal during a second cycle of operation of said data processing system;

first input means responsive to said address cycle signal for storing a first set of said plurality of information signals during said first cycle of operation and for addressing a predetermined RAM location during said second cycle of operation;

second input means responsive to said data cycle signal for storing a second set of said plurality of information signals including RAM selection signals for selecting a predetermined RAM, said second set of said plurality of information signals including data signals for writing data bits into said predetermined RAM location during said second cycle of operation;

decoding means coupled to said cycle selection means and responsive to said data cycle signal and said RAM selection signals for generating a first write signal during said second cycle of operation; and

RAM means being enabled by said first write signal for writing said data bits specified by said data signals into said predetermined RAM location specified by said set of said plurality of information signals during said second cycle of operation.

4,458,310

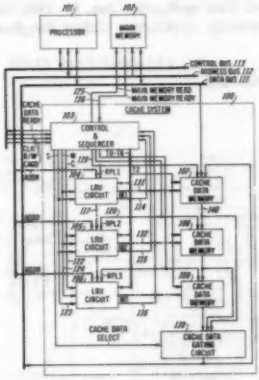
CACHE MEMORY USING A LOWEST PRIORITY REPLACEMENT CIRCUIT

Shih-Jeh Chang, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 2, 1981, Ser. No. 307,857

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **17 Claims**



1. A data processing system comprising:

a processor means for generating main memory address signals;

a main memory having a plurality of memory locations for storing main memory words;

a cache control means;

first and second cache memories each having a plurality of memory locations for storing main memory addresses and corresponding cache data words in a priority order, and each responsive to main memory address signals which mismatch all of the main memory addresses stored therein to generate and transmit a mismatch signal to said cache control means;

said cache control means responsive to concurrent generation of said mismatch signals by said first and second cache memories to generate and transmit a first control signal to said main memory and said first and second cache memories;

said main memory responsive to said first control signal and said mismatched main memory address signals to access and transmit a main memory word to said first cache memory;

said first cache memory responsive to said first control signal to transmit the lowest priority cache data word and its corresponding stored main memory address to said second cache memory, and to store said transmitted main memory word and said main memory address signals; and

said second cache memory responsive to said first control signal to store the transmitted lowest priority cache data word and its corresponding main memory address.

4,458,311

TEXT PROCESSOR HAVING AN INTERACTIVE DISPLAY TERMINAL WHICH ALTERNATELY FUNCTIONS AS A DATA PROCESSING TERMINAL

Silous F. Clements, Georgetown; Patrick D. Motola, Richard O. Simpson, and Shirley F. Swift; Michael N. Day, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 9, 1981, Ser. No. 310,184

Int. Cl.³ G06F *15/20, 3/14*

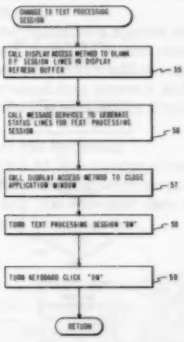
U.S. Cl. 364—200 **11 Claims**

1. In an information processing system for conducting data

processing operations wherein the processing relates to the value of the information and conducting text processing operations wherein the processing relates only to the format of the information, the improvement comprising

means for initiating a data processing session in said system,

means for initiating a text processing session in said system,


CHANGE TO TEXT PROCESSING SESSION
CALL DISPLAY ACCESS METHOD TO CLEAR DT SESSION LINES IN DISPLAY REFRESH BUFFER
55
CALL MESSAGE SERVICES TO GENERATE STATUS LINES FOR TEXT PROCESSING SESSION
56
CALL DISPLAY ACCESS METHOD TO CLOSE APPLICATION WINDOW
57
TURN TEXT PROCESSING SESSION "ON"
58
TURN KEYBOARD CLICK "ON"
59
RETURN

means for switching to said text processing session before the completion of said data processing session,

means for storing the status of said non-completed data processing session during said text processing session, and

means for switching back from said text processing session to said non-completed data processing session.

4,458,312

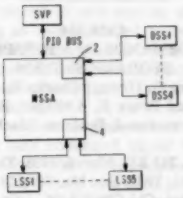
RAPID INSTRUCTION REDIRECTION

Thomas A. Stranko, and Robert L. Swann, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 10, 1981, Ser. No. 319,870

Int. Cl.³ G06F *3/00, 13/00*

U.S. Cl. 364—200 **4 Claims**



1. In a data processing system in which a processor communicates with a plurality of satellite monitoring devices through a single intermediate adapter, a mechanism within the intermediate adapter for simultaneously transmitting status information with information identifying to the processor a particular satellite monitoring device in the plurality of satellite monitoring devices which has detected an anomally during its monitoring operations comprising:

means for receiving a first interrupt signal from said particular satellite monitoring device to said adapter on the occuring of said anomally;

means for responding to the receipt of said first interrupt signal by said adapter by transmitting a second interrupt signal to said processor, said second interrupt signal indicating that said first interrupt signal was of a particular class;

means for receiving from said processor an acknowledgment to said second interrupt which initiates a request for additional information regarding said particular satellite monitoring device which detected the anomally;

means responsive to said acknowledgment for transmitting said request to said particular satellite monitoring device;

means for receiving said additional information from said particular satellite monitoring device subsequent to the transmission of said request to said particular satellite monitoring device; and

means for providing a single response from said adapter to said processor subsequent to the receipt of said additional information from said particular satellite monitoring device which both identifies said particular satellite device and includes said additional information.

4,458,313

MEMORY ACCESS CONTROL SYSTEM

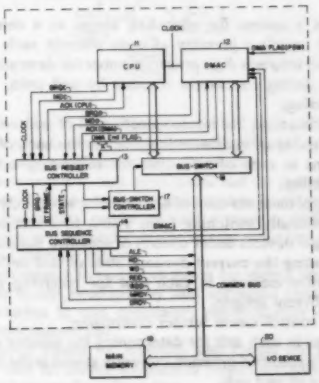
Seigo Suzuki, Yokohama; Seiji Eguchi, Kawasaki, and Yoshiaki Moriya, Inagi, all of Japan, assignors to Tokyo Shibaura Electric Company, Ltd., Kawasaki, Japan

Continuation-in-part of Ser. No. 193,461, Oct. 3, 1980, abandoned, which is a continuation of Ser. No. 872,733, Jan. 26, 1978, abandoned, which is a continuation-in-part of Ser. No. 732,729, Oct. 15, 1976, abandoned. This application Nov. 25, 1981, Ser. No. 324,958

Claims priority, application Japan, Oct. 15, 1975, 50-124151

Int. Cl.³ G06F *9/06, 13/00*

U.S. Cl. 364—200 **2 Claims**



1. A memory access control system including an integral assembly of a central processing unit and a direct memory access controller, said integral assembly generating commands and request signals, said system comprising:

a main memory;

an I/O device;

bus means interconnecting said memory and said I/O device to each other, to said central processing unit, and to said direct memory access controller;

means for generating a logic signal representing the logic status of a predetermined bit position in a said generated command;

a bus controller for generating a control signal in response to said logic signal and to a request signal from said integral assembly

a bus switch connected to said bus means and responsive to said control signal, said bus switch controlling said bus means to place said memory and said I/O device under the control of said integral assembly when said bus controller receives a logic signal representative of one logic status of said predetermined bit position and to perform a cycle steal memory access between said memory and said I/O device when said bus controller receives a logic signal

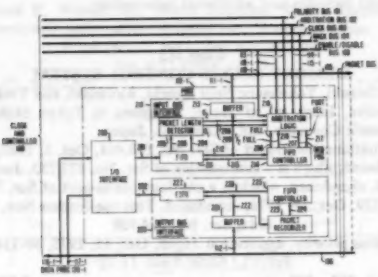
representative of another logic status of said predetermined bit position.

4,458,314

CIRCUITRY FOR ALLOCATING ACCESS TO A DEMAND SHARED BUS

Gary J. Grimes, Thornton, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 7, 1982, Ser. No. 337,868
Int. Cl.³ G06F *7/02*
U.S. Cl. 364—200 **18 Claims**



1. In a system for allocating access to a demand-shared facility among a plurality of units wherein each unit has an assigned unique n digit priority number for determining facility access during concurrent requests by said units, said system comprising;

an arbitration bus interconnecting all of said units,

a plurality of multistate logic devices in each of said units,

means in each of said units for requesting access to said facility,

control means in each of said units for selectively and combinationally switching from a first to a second state said logic devices under control of specified parameters representing the current dynamic state of said units,

a buffer memory in each unit for receiving messages of different lengths,

said control means further comprising;

means in each unit for determining the number of messages of a specified criterion currently stored in the buffer memory of said unit,

means for switching from a first to a second state at least a first one of said logic devices of a unit to indicate the presence of at least a predetermined number of messages of said specified criterion in the buffer memory of said unit,

means for forming a dynamic priority number for each of said units by applying the outputs of said logic devices of each unit as parameter digits to the more significant digit positions of said dynamic number and by applying the digits of the assigned priority number of each unit to the lesser significant digit positions of said dynamic number,

means in each of said units currently requesting access to said demand-shared facility for concurrently superimposing the corresponding digits of the associated dynamic priority number onto said arbitration bus sequentially digit by digit,

means for comparing the digit values on said bus with the corresponding digit values applied by each of said requesting units, and

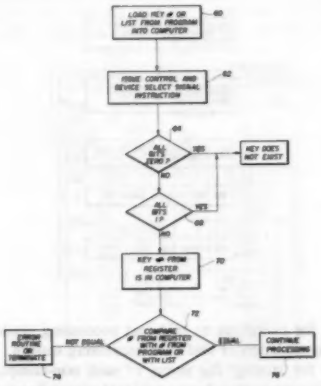
means for removing from facility access contention a requesting one of said units upon the detection of a prescribed comparison result between a bus digit value and the corresponding digit value of said unit.

4,458,315

APPARATUS AND METHOD FOR PREVENTING UNAUTHORIZED USE OF COMPUTER PROGRAMS

Gordon Uchenick, Baltimore, Md., assignor to Penta, Inc., Baltimore, Md.

Filed Feb. 25, 1982, Ser. No. 352,291
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—200 **12 Claims**



1. An apparatus for detecting unauthorized use of a computer program having first key information stored therein, comprising,

means physically separate from said computer program but which may be associated with a computer in which said program is to be processed, for storing second key information,

means which is operable before substantial processing of said program has occurred for comparing said first and second key information, and

means for generating an error signal if said first and second key information do not bear a predetermined relationship to each other.

4,458,316

QUEUING COMMANDS IN A PERIPHERAL DATA STORAGE SYSTEM

Scott M. Fry; Harry O. Hempy; Charles R. Kirkpatrick, all of Tucson, Ariz., and Bruce E. Kittinger, Fort Collins, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 241,322, Mar. 6, 1981. This application Oct. 11, 1983, Ser. No. 540,218
Int. Cl.³ G06F *9/06, 3/06*
U.S. Cl. 364—200 **4 Claims**

1. In a data processing system, including peripheral data recorders having an addressable data record medium for storing data with recording heads in transducing relationship to said record media, a host processor for issuing commands for the peripheral data recorders, including addresses of the peripheral data recorder to respond to the issued command, calling for transfer of data records between said host processor and said peripheral data recorders, a buffer store for storing said data records, and a storage control unit connected between said host processor, said buffer store and said peripheral data recorders, and being responsive to said issued commands for responding thereto;

the improvement comprising:

storage means in the control unit for storing a command queue and a buffer control table having a buffer record table portion for indicating the location of each record stored in said buffer and a buffer status table portion for indicating to which recorders a section of the buffer store

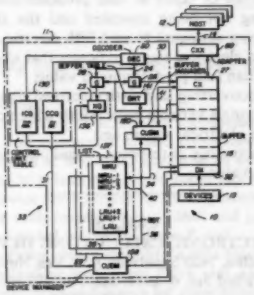
is allocated and for indicating whether a read or write operation is to occur with respect to the indicated section of the buffer store;

said buffer record table portion having an entry therein corresponding to each said section of said buffer store, each of said entries having a change bit indicating that the corresponding records of data have been written into said buffer store by said host processor via respective ones of said issued commands;

said command queue comprising a series of said commands issued by said host processor to said storage control unit and waiting to be executed by said storage control unit to transfer predetermined data between said host processor and said peripheral data recorders through said storage control unit;

said storage control unit including:

first means connected to said storage means for examining said buffer control table to identify an entry in said buffer status table portion that indicates data written into the buffer store by said host processor;



second means coupled to said first means and to said command queue storage for being responsive to said first means identifying an entry that indicates data written to said buffer store for forming a command in said command queue storage for directing the control unit to transfer the data records stored in said section of the buffer store corresponding to said identified entry from said buffer store to said peripheral data recorder;

third means connected between said second means and said storage for entering said formed command into said command queue; and

device manager means coupled to said storage for being responsive to said command queue for executing said formed command when the peripheral data recorder having allocation of said identified section of the buffer store is not busy or said host processor issued commands when the addressed data recorder is not busy;

whereby the transfer of data stored in the written-to section of the buffer store to said peripheral data recorder is accomplished without intervention of said host processor.

4,458,317

TELLER MACHINE HAVING AN ALTERABLE SECONDARY MEMORY

Koichi Horigome, Nara; Seizo Okada, Osaka; Katsuji Nishimura, Habikino, and Hachizou Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 43,833, May 30, 1979, abandoned. This application Jun. 29, 1982, Ser. No. 393,341

Claims priority, application Japan, Jun. 1, 1978, 53-66396

Int. Cl.³ G06F *15/30*

U.S. Cl. 364—406 **2 Claims**

1. A teller machine comprising:

input means for introducing numeral and function individual transaction data of each individual transaction introduced into said teller machine;

processing means responsive to said individual transaction data introduced by said input means for performing calculations for each individual transaction and thereby producing transaction results;

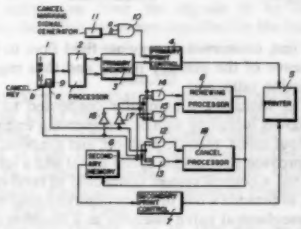
first memory means responsive to said processor means for storing therein the individual transaction data and transaction results of each individual transaction;

second memory means responsive to said first memory means for storing a cumulative representation of all transaction results performed over a period of time;

said input means introducing error information related to errors made in the introduction of individual transaction data of at least one individual transaction;

said processor means comparing said error information with said individual transaction data stored in said first memory to detect a coincidence with said individual transaction data;

modification means responsive to said input means for correcting the transaction data and transaction results of said



at least one individual transaction having data erroneously entered, said modification means including,

means responsive to said input means and the detection of a coincidence by said processor means for subtracting said transaction results of said erroneous individual transaction from said cumulative representation in said second memory means,

means responsive to said input means for adding the transaction results produced by said corrected transaction information to said cumulative representation in said memory means, and

switch-over means for enabling said means for adding after said erroneous transaction results are subtracted by said means for subtracting;

cancel marking generator means responsive to the operation of said modification means for producing a cancel marking on the printed transaction results;

means responsive to said input means for retrieving and printing the transaction results stored in said first memory means and the cumulative representation of teller transaction results stored in said second memory means.

4,458,318

CONTROL ARRANGEMENT FOR A VARIABLE PULLEY TRANSMISSION

Geoffrey N. Smit, Rancho Palos Verdes, Calif.; Scott R. Anderson, Evergreen Park, and Shan-Chin Tsai, Arlington Heights, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 24, 1981, Ser. No. 257,036

Int. Cl.³ F16H *9/18, 11/06, 55/54;* G05D *17/02*

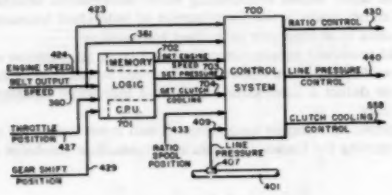
U.S. Cl. 364—424.1 **11 Claims**

7. A control arrangement for a continuously variable transmission including a primary pulley for receiving drive from an engine, a secondary pulley, a belt coupling the secondary pulley to the primary pulley, and a fluid-cooled clutch connected to transfer dirve from the secondary pulley to a driven

means, with the primary pulley having an axially movable sheave to effect ratio change of the transmission and the secondary pulley having an axially movable sheave to regulate belt tension in the system, a fluid supply line connected to receive fluid under pressure, and also coupled to the movable sheave of the secondary pulley, which control arrangement comprises

a first electromechanical valve assembly, coupled to the supply line, connected to regulate the supply line pressure passed to the movable sheave of the secondary pulley and thus regulate the belt tension level,

a second electromechanical valve assembly, coupled to the



supply line, connected to regulate fluid flow to the movable sheave of the primary pulley and thus regulate the transmission ratio, and

a controller including a computer connected to received input signals including signals representing engine speed, belt output speed, throttle position, and gearshift position, and to provide a set engine speed signal and a set pressure signal, and a control system connected to receive said set signals, to provide a line pressure control signal to the first electromechanical valve assembly as a function of the set pressure signal, and to provide a ratio control signal to the second electromechanical valve assembly as a function of the set engine speed signal.

4,458,319

METHOD AND APPARATUS FOR CONTROLLING THE AIR-FUEL RATIO IN AN INTERNAL COMBUSTION ENGINE

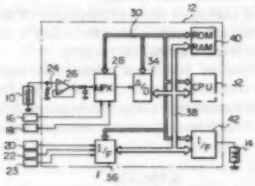
Yoshiki Chujo, Susono; Takehisa Yaegashi, Mishima, and Shinichi Sugiyama, Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 24, 1981, Ser. No. 276,995

Claims priority, application Japan, Jun. 30, 1980, 55-87918

Int. Cl.³ F02B *3/04*; F02D *35/00*; F02M *51/00*

U.S. Cl. 364—431.06 **14 Claims**



9. An air-fuel ratio control apparatus of an internal combustion engine comprising:

at least one fuel injection valve;

exhaust gas sensing means for detecting the concentration of a predetermined component in the exhaust gas of said engine to produce a voltage signal indicative of the detected concentration;

means for intermittently sampling the voltage signal from said exhaust gas sensing means to produce a first electrical signal in the form of a binary number, indicative of the sampled voltage;

means for detecting the operating condition of the engine to produce a second electrical signal in the form of a binary number, indicative of the detected operating condition;

electrical digital computer means for: (1) finding the maximum value and the minimum value of said first electrical signal and producing a maximum signal and a minimum signal, respectively related to said maximum value and minimum value; (2) comparing the magnitude difference between said maximum signal and said minimum signal with a predetermined value to produce a third electrical signal indicative of the comparison result; (3) comparing the value of said first electrical signal with a reference value to produce a fourth electrical signal indicative of the comparison result; (4) calculating, in response to said second electrical signal, the fuel feeding rate to the engine to produce a fifth electrical signal indicative of the calculated fuel feeding rate; and (5) correcting, by means of said digital computer, the calculated fuel feeding rate indicated by said fifth electrical signal in accordance with said fourth electrical signal to produce a sixth electrical signal indicative of the corrected fuel feeding rate when said third electrical signal indicates that said difference is greater than or equal to said predetermined value, said correcting not being executed and the sixth electrical signal being set equal to said fifth electrical signal when said third electrical signal indicates that said difference is smaller than said predetermined value;

means for converting said sixth electrical signal into a pulse signal having a variable pulse width which corresponds to said sixth electrical signal; and

means for actuating, in response to said pulse signal, said fuel injection valve.

4,458,320

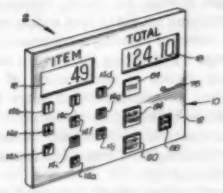
ELECTRONIC CALCULATING DEVICE

Gordon R. Sutton, 7425 Sepulveda #30, Van Nuys, Calif. 91405

Filed Jul. 6, 1981, Ser. No. 280,868

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—464 **21 Claims**



1. An electronic calculating device, comprising:

item storage means for storing an item-price number representing the price of an individual item;

input means for entering said item-price number into said item storage means, said input means including a keyboard having manually-operable input keys for the digits 0 through 9, inclusive;

total storage means for storing a total number representing a total of the prices of a plurality of items;

display means for visually displaying said item-price number and said total number;

accumulator means for receiving and adding together said item-price number and said total number to provide an increased-total number representing said total of the prices of said plurality of items increased by said price of said individual item, said accumulator means then entering said increased-total number into said total storage means in replacement of said total number; and

data transfer means for transferring said item-price number from said item storage means to said accumulator means, said data transfer means including delay means for automatically triggering such transfer only after a predeter-

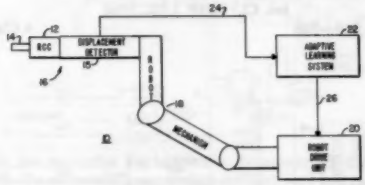
mined delay period following entry of said item-price number into said item storage means.

4,458,321

SELF-TEACHING ROBOT FEEDBACK SYSTEM

Daniel E. Whitney, and Donald S. Seltzer, both of Arlington, Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Aug. 19, 1981, Ser. No. 294,349
Int. Cl.³ G05B *13/00*; G06F *9/00*
U.S. Cl. 364—513 **2 Claims**



1. A self-teaching RCC device robot feedback system comprising:

a robot mechanism;

an RCC device carried by said robot mechanism;

a robot drive unit connected to said robot mechanism for directing motion of said RCC device in an environment;

means mounted to at least one of said robot mechanisms and said RCC device for determining the displacement of said RCC device with respect to said robot and generating a displacement signal indicative thereof; and

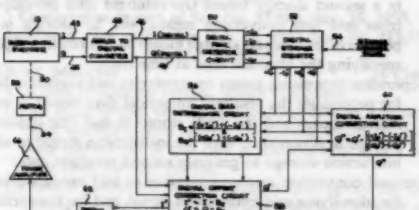
an adaptive learning system including a data base containing data for controlling said robot drive unit and updating means responsive to said means for determining displacement, for determining a pattern of displacements of said RCC device relative to the environment arising from repeated executions of the same robot task and generating updated signals to said data base to update the data therein, said data base being responsive to said updated signals for generating updated command signals to said robot driver unit to direct motion of said RCC device.

4,458,322

CONTROL OF PAGE STORAGE AMONG THREE MEDIA USING A SINGLE CHANNEL PROCESSOR PROGRAM AND A PAGE TRANSFER BUS

John R. Veale, Manhattan Beach, Calif., assignor to Manhattan Engineering Co., Inc., Manhattan Beach, Calif.

Filed Jun. 19, 1981, Ser. No. 275,416
Int. Cl.³ G05B *1/02*
U.S. Cl. 364—571 **27 Claims**



1. Digital error correcting circuitry, for correcting signals for offset errors, comprising:

means for providing the signals in digital form and which signals have a first phase relationship when a first signal leads a second signal identifying a first direction, and a second phase relationship when the first signal lags the second signal identifying a second direction;

detection means for detecting the peak amplitude values of each of the signals;

storage means for storing the detected peak amplitude values of each of the signals, in response to a storage command signal and which may store such peak amplitude values for an indefinite time period, which may substantially exceed the time required for correction of signals for offset errors;

bias determining means responsive to the stored peak amplitude values, including the last of the stored peak amplitude values and which may have been stored for a substantial period of time, for providing a bias signal for each of the signals to be corrected, each bias signal having a magnitude and polarity equal to the offset from a zero baseline of a respective one of the signals to be corrected; and

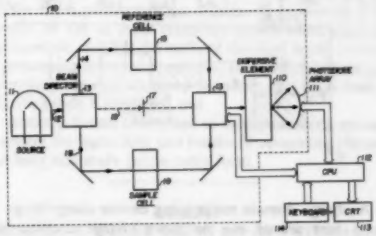
offset correction means responsive to the bias signal and to the signals to be corrected, for applying the bias signals to the signals to be corrected in such manner to be additive to or subtractive from the signals to be corrected, whereby the offset errors are cancelled by the bias signals.

4,458,323

METHOD OF PERFORMING MEASUREMENTS AND ERROR ANALYSIS OF THE MEASUREMENTS

Barry G. Willis, Los Altos Hills; Arthur Schleifer; Norton W. Bell, both of Palo Alto, all of Calif.; Paul C. Dryden, West Chester, Pa.; Andrew Stefanski, Menlo Park, Calif., and C. Nelson Dorny, Broomall, Pa., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 141,491, Apr. 18, 1980, Pat. No. 4,357,673.
This application Mar. 26, 1982, Ser. No. 362,217
Int. Cl.³ G01J *3/42*; G06F *15/20*
U.S. Cl. 364—582 **15 Claims**



12. A method of reducing the amount of memory required to produce average and error values in a measuring apparatus having a measurement section for performing measurements and having an internal calculating section to produce from the measurements an average value and an error value, said method comprising the steps of:

(a) performing a plurality of sets of measurements, each set including a sample measurement producing a sample measured data S, a reference measurement producing a reference measured data R and a dark measurement producing a dark measured data D;

(b) as step (a) is being performed, generating from each set of measured data a normalized dark-corrected value V equal to $(S-D)/(R-D)$;

(c) as step (a) is being performed, generating from the values V a pair of numbers E1 and E2 which are functionally independent functions of N1 and N2 where N1 is the sum of the values V for the sets of measurements and N2 is the sum of the squares of the values V, E1 and E2 being functionally independent functions of N1 and N2 so that these functions can be inverted to yield N1 and N2; E1

and E2 being updated by measured data at a rate as fast as the measured data is generated, whereby the amount of memory required to produce E1 and E2 is independent of the number of measurements performed; and

(d) after the performance of the last measurement, generating from E1 and E2, an average value for the measurement data and an error value representing the statistical uncertainty of the average value, thereby reducing the burden on memory that would otherwise result if all of the data had to be stored before calculation of average and error values for data.

4,458,324

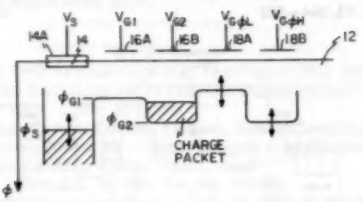
CHARGE DOMAIN MULTIPLYING DEVICE

Barry E. Burke, Lexington; Alice M. Chiang, Weston, and William T. Lindley, Lexington, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 20, 1981, Ser. No. 294,633

Int. Cl.³ G06J 1/00; G06G 7/16; H03K 13/02

U.S. Cl. 364—606 **30 Claims**



1. A charge domain multiplying device comprising:

A. a first set of one or more charge coupled devices (CCD's),

B. a first set of one or more input means, each of said input means being associated with and coupled to one of said CCD's and characterized by a predetermined weight, and including means for selectively establishing a charge packet in the CCD associated with said input means, said charge packet having a magnitude varying with the product of said predetermined weight and the difference between an input potential V and a reference potential, ϕ_{ref},

C. a set of one or more charge injection means, each injection means being coupled between an associated input electrode and the associated CCD, wherein each of said input means further includes at least two adjacent conductive electrodes overlying its associated CCD, wherein the first of said adjacent electrodes for each CCD has a characteristic capacitance proportional to the predetermined weight of that input means, and the second of said adjacent electrodes is between said first electrode and said injection means; and

D. charge summing means for generating an output signal representative of the sum of the charge packets in said CCD's.

4,458,325

CALCULATOR CAPABLE OF CALCULATING WITH ADDITIONAL EXTERNALLY INSTRUCTED UNITS

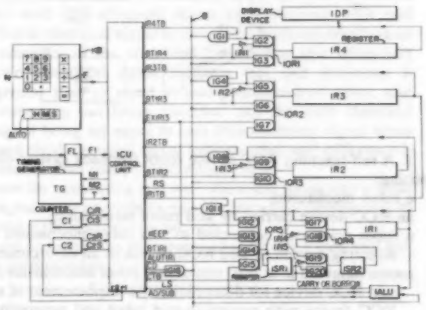
Shinichi Nakata, Kawasaki; Hiroshi Takahashi, Yokohama; Shigeru Matsuyama, Tokyo, and Reiji Hirano, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 084,765, Oct. 15, 1979, abandoned, which is a continuation of Ser. No. 902,956, May 4, 1978, abandoned, which is a continuation of Ser. No. 764,557, Feb. 1, 1977, abandoned. This application Aug. 19, 1981, Ser. No. 294,279

Claims priority, application Japan, Feb. 4, 1976, 51-11069; Feb. 4, 1976, 51-11070; Feb. 4, 1976, 51-11071

Int. Cl.³ G06F 3/02, 5/02

U.S. Cl. 364—705 **4 Claims**



1. Electronic data processing equipment comprising:

an input keyboard including a set of decimal number keys for entering digits of decimal numbers, a unit indicating key for entering a time unit, instruction keys for entering instructions corresponding to the four fundamental arithmetic rules, and an execution key for permitting the instructions to be executed;

a first numeral storage for storing digits entered from said decimal number keys;

a time unit storage for storing a time unit entered from said unit indicating key;

an instruction storage for storing instructions entered from said instruction keys;

first conversion means for converting the digits stored in said first numeral storage into resultant numerical data with the unit of seconds in accordance with the time unit stored in said time unit storage to develop the resultant numerical data;

control means responsive to said instruction keys for storing in a second storage means the resultant data developed from said first conversion means, and for storing in a portion of said second storage means an information signal specifying the resultant data as time data;

operation processing means responsive to said execution key for processing the resultant numerical data stored in said storage means and the digits stored in said first numeral storage in accordance with the instructions stored in said instruction storage to generate second resultant data;

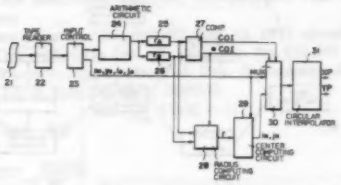
second conversion means responsive to said execution key for identifying said information signal, and for converting the second resultant data obtained from the processing of said operation processing means into numerical data having units of hours, minutes and/or seconds in accordance with the magnitude of the second resultant data; and

means for visualizing the numerical data converted in said second conversion means.

4,458,326
METHOD AND APPARATUS FOR CIRCULAR INTERPOLATION

Mitsuo Kinoshita, Hachioji, Japan, assignor to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Aug. 19, 1981, Ser. No. 294,248
Claims priority, application Japan, Sep. 8, 1980, 55-124164
Int. Cl.³ G05B *19/415*
U.S. Cl. 364—723 **6 Claims**



4. An apparatus for automatically correcting the circular path of a numerically controlled machine tool and performing a circular interpolation operation in accordance with a given arc center **0**, machine tool arc starting point P_s and machine tool arc end point P_e, comprising:

first means for receiving said given arc center **0**, said machine tool arc starting point P_s and said machine tool arc end point P_e;

a first arithmetic unit operatively connected to said first means, for computing a distance r_A from the given arc center **0** to the given machine tool arc end point P_s, and a distance r_B from the given arc center **0** to the given machine tool arc end point P_e;

a comparator unit operatively connected to said first arithmetic unit, for determining whether the distances r_A and r_B are equal;

a second arithmetic unit operatively connected to said first arithmetic unit, to said first means and to said comparator unit for computing a new arc center 0_N of an arc passing through said machine tool arc starting point P_s and said machine tool arc end point P_e in response to the distance r_A and the distance r_B being unequal; and

a circular interpolation unit operatively connected to said comparator unit, to said first means and to said second arithmetic unit, for executing a circular interpolation operation in accordance with the computed arc center 0_N, the given machine tool arc starting point P_S and the given machine tool arc end point P_e and for controlling the numerically controlled machine tool.

4,458,327
PRIME OR RELATIVELY PRIME RADIX DATA PROCESSING SYSTEM

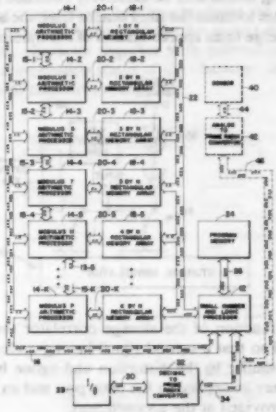
J. Marion McCoskey, Round Mountain, Calif., assignor to John Larson, Sonoma, Calif., a part interest

Continuation-in-part of Ser. No. 53,083, Jun. 28, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 219,321
Int. Cl.³ G06F *7/72*
U.S. Cl. 364—746 **34 Claims**

1. A data processing system, which comprises:

(a) an input/output device for inputting data in a constant radix number system and for outputting results of operations carried out in said data processing system in a constant radix number system,

(b) means connected to said input/output device for converting the input data from a constant radix number system to a number system in which the radices of all digits in a number are at least relatively prime, and for converting the results of the operations from the at least relatively prime radix form to the constant radix number system by solving a linear congruence of the at least relatively prime radices through use of a relationship equivalent to:



$$\left(\left[\left(\left[\left(\frac{1}{B|P}\right)C\right] \bmod P - B + A\right.\right.\right.$$

$$\left.\left.\left.\left[\left(\frac{1}{B|P}\right)A \bmod P\right] \bmod P\right) + P\right] \bmod P\right)$$

wherein A is the converted value of preceeding at least relatively prime radix digits to the digit being converted; B is the product of all radices of at least relatively prime radix digits preceeding the digit being converted, C is the value of the at least relatively prime radix digit being converted, and P is the radix of the digit being converted,

(c) processing means connected to said converting means for carrying out operations on the input data in at least relatively prime radix form, and

(d) memory means connected to said processing means for storing the input data and results of operations thereon in at least relatively prime radix form.

4,458,328
ADAPTIVE FILTER USING AN ASW STORAGE CORRELATOR

Gordon S. Kino, Stanford, Calif.; David Behar, Kiriat Bialik, Israel; John E. Bowers, Mountain View, Calif., and Hermund Olaisen, Flateby, Norway, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 13, 1981, Ser. No. 234,526
Int. Cl.³ G06G *7/122, 7/19;* **H03H** *21/00*
U.S. Cl. 364—825 **4 Claims**

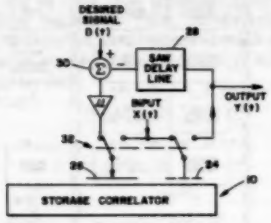
1. An adaptive inverse filter comprising:

(a) an acoustic surface wave storage correlator having a plate port and at least one acoustic port;

(b) a delay line having an input and an output;

(c) switching means having two states, the first state coupling an input signal to be filtered to the plate port and the filter output signal from the acoustic port to the input of said delay line, said output signal being the convolution of the input signal and the weight function stored at that time in the storage correlator, the second state coupling an error signal to the plate port and the input signal to the acoustic port whereby the correlation of the input signal and the error signal is added to the weight function stored at that time in the storage correlation; and

(d) means for subtracting the output of said delay line from a training signal to provide said error signal, whereby the switching means may be iteratively switched between the two states to cause the filter output from the acoustic port to converge to an approximation of the training signal, the



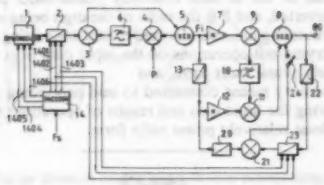
weight function of the storage correlator thereby being adjusted so that a second signal having undergone a distortion similar to the distortion undergone by the input signal may be applied to the plate port and an undistorted signal provided at the acoustic port.

4,458,329

FREQUENCY SYNTHESIZER INCLUDING A FRACTIONAL MULTIPLIER

Joël Remy, Paris, France, assignor to Adret Electronique, France

Filed Dec. 2, 1981, Ser. No. 326,773
Claims priority, application France, Dec. 31, 1980, 80 27872
Int. Cl.³ G06G *7/26*
U.S. Cl. 364—851 **7 Claims**



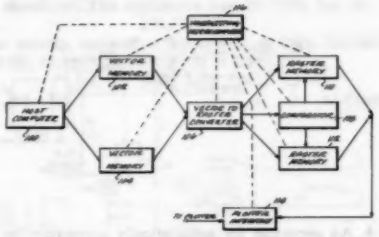
1. A device for generating a variable frequency comprising an integral multiple PN of a great frequency incremental step P and an increment which in turn comprises a component which can vary by small incremental steps ξ and a carrier frequency Fo, in which said increment is generated by a frequency synthesizer, said device including a pre-settable first frequency divider connected to the output of said frequency synthesizer, a first phase comparator, a first input of which is connected to the output of said first frequency divider and the output of which is connected to the frequency control input of a first voltage-controlled oscillator, a subtractive mixer which is supplied both with a standard frequency equal to said incremental steps P and with the output frequency of said first oscillator, a pass-band filter connecting the output of said subtractive mixer to a second input of said first phase comparator, and means for multiplying an intermediate frequency Fi generated by said first oscillator by a factor having an integral component equal to N, characterized in that said factor of multiplication of said intermediate frequency includes a fractional component in the form (M/R) and the division rate of said first frequency divider is in the form NR'M wherein R is a predetermined integer.

4,458,330

BANDED VECTOR TO RASTER CONVERTER

Bruce E. Imsand, Huntsville; Chris L. Thomas, Harvest, and David D. Dorfmueller, Owens Cross Roads, all of Ala., assignors to Intergraph Corporation, Huntsville, Ala.

Filed May 13, 1981, Ser. No. 263,192
Int. Cl.³ G06F *5/00*
U.S. Cl. 364—900 **77 Claims**



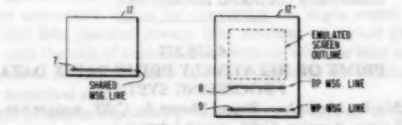
1. A method of rasterizing vectors in a predetermined space comprising the steps of:
(a) for any one of said vectors, determining the coordinates of a plurality of points in said vector;
(b) determining whether each of said coordinates is within said space;
(c) retaining the coordinates favorably determined in step (b); and
(d) repeating steps (a)–(c) for other vectors until all of said vectors have been processed.

4,458,331

INTERACTIVE DISPLAY TERMINAL WITH ALTERNATING DATA PROCESSING AND TEXT PROCESSING SESSIONS WITH TEXT PROCESSING STATUS LINE OPERABLE DURING DATA PROCESSING SESSION

Robert Amezcua, Austin; Silous F. Clements, Georgetown; Richard P. Dachowski, Round Rock, and Patrick D. Motola, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 9, 1981, Ser. No. 309,985
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—900 **7 Claims**



1. In an information processing system comprising an interactive display terminal used with a word processor to display text in a word processing mode wherein the word processing operations affect only the format of the displayed text or alternately used with a data processor to display data in a data processing mode wherein the data processing operations affects the value of the displayed data, said interactive display terminal displaying a data processing message line to the operator while in the data processing mode and said word processor being capable of carrying out a background word processing task while said interactive display terminal is in the data processing mode, the improvement comprising,
means operative during the data processing mode of the interactive display terminal and while a background word processing task is being performed for displaying a message to the operator relative to the word processing task.

4,458,332
METHOD OF EXECUTING AN ADDRESS-JUMP COMMAND IN A STORED-PROGRAM SEQUENTIAL-CONTROL SYSTEM FOR PROCESSING MACHINES, AND IN PARTICULAR FOR INDUSTRIAL SEWING MACHINES, AND SEQUENTIAL-CONTROL CIRCUITRY FOR THE PRACTICE OF THE METHOD

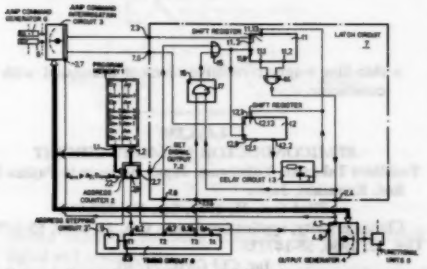
Alfred Heidt, Schwetzingen, Fed. Rep. of Germany, assignor to Frankl & Kirchner GMBH & Co KG Fabrik für Electromotoren und electrische Apparate, Schwetzingen, Fed. Rep. of Germany

Continuation of Ser. No. 047,602, Jun. 11, 1979, abandoned. This application Oct. 21, 1981, Ser. No. 313,693

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1978, 2827808; Nov. 22, 1978, 2850538

Int. Cl.³ G06F *9/32*

U.S. Cl. 364—900 **24 Claims**



1. In a method of executing an address jump command in a stored program sequential control system for sequencing electrically actuatable functional units, the system having a plurality of jump command generators each capable of generating a jump command, a jump command interrogation circuit, an address counter which is settable to a desired count and is advancable in a step-wise manner from any count, a program memory connected to the output of the address counter and having data stored therein at each address, the data being of a first type for selecting a functional unit or a second type for selecting one jump command generator via the jump command generator interrogation circuit and a timing pulse generator generating stepping signals for effecting the system timing, the improvement comprising the steps of: advancing the address in the address counter a step for each stepping signal generated by the timing generator; sensing the data from the program memory at the address counter address and generating a set signal if the data is of the second type; loading a jump address in the address counter in response to the set signal if the selected jump command generator generates a jump command, wherein the step of loading comprises advancing the address counter to the next address by one of the stepping signals, and transferring the data in the program memory at said next address into the address counter in response to the set signal whereby the data transferred from said next address constitutes the jump address; generating a transfer signal from the timing generator between every two stepping signals; and actuating the selected functional unit in response to the transfer signal if the data from the program memory at the present address is of the first type.

4,458,333
DOT MATRIX CHARACTER PRINTING USING CONSTRAINED MEMORY

Bruce A. Smith, Delray Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

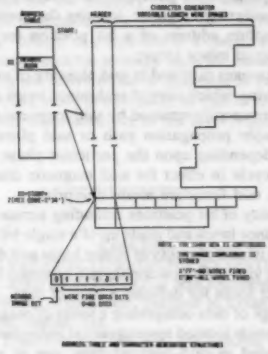
Filed Dec. 21, 1981, Ser. No. 332,584

Int. Cl.³ G06F *3/14*

U.S. Cl. 364—900 **4 Claims**

1. In a printer in which some characters from a finite alphabet are locally stored as compressed dot matrix objects, all characters being selectively accessed from the store and applied to a movable wire matrix printhead, a method for reconstituting compressed objects comprising the steps of:

prestoring at least a portion of the dot matrix defining each alphabetic character together with information designating the compression status of the character about at least one apis of reflective symmetry;



referencing the local store to extract characters in print serial order;

ascertaining whether a referenced character is compressed; and

applying the dots of each compressed referenced character to the printhead in column major order and then applying the dots in reverse column major order, otherwise applying the dots only in column major order if the referenced character is not compressed.

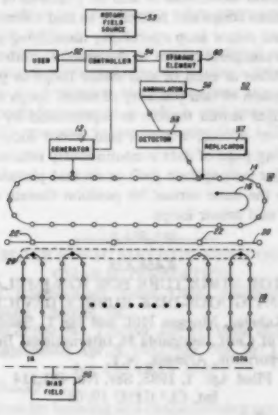
4,458,334
REDUNDANCY MAP STORAGE FOR BUBBLE MEMORIES

James B. Hall, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 16, 1977, Ser. No. 796,934

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—1 **7 Claims**



1. A magnetic domain memory device comprising:

a magnetic film capable of supporting magnetic domains;

a major propagation path disposed on said magnetic film for propagating said magnetic domains;

a plurality of minor loops disposed on said magnetic film adjacent to said major propagation path for storing said magnetic domains with one or more of said minor loops being inoperable, each of said minor loops having a plurality of bit positions for the storage of data as represented by a magnetic domain or a void and the total number of bit positions for each respective minor loop being the same;

transfer means disposed on said magnetic film between said major propagation path and said plurality of minor loops for transferring magnetic domains therebetween at a single absolute address of a bit position for each of said plurality of minor loops;

firmware means disposed in said plurality of minor loops for identifying which ones of said minor loops are inoperable and permanently retained by said magnetic film either on said major propagation path or said plurality of minor loops depending upon the particular phase of the operational cycle in effect for said magnetic domain memory device, said firmware means comprising

a plurality of bit positions extending across said plurality of minor loops and made up of a single bit position from each of said plurality of minor loops and disposed in the same virtual bit position therein common to each of said minor loops for defining a page of data,

said page of data comprising a series of magnetic domains and voids located respectively at individual bit positions included in said page of data, one of said magnetic domains and voids representing an operable minor loop, and the other of said magnetic domains and voids representing an inoperable minor loop; and

control means for regulating the operational cycle of said magnetic domain memory device, said control means being operably associated with said magnetic film to impart propagating movement to said magnetic domains from one storage position at one absolute address to another storage position at another absolute address;

said control means including a page counter having a predetermined total count corresponding to the number of bit positions provided in each minor loop, said page counter being set at a reference number when said page of data identifying which ones of said minor loops are operable and inoperable is disposed in juxtaposition to said transfer means in which each of said common bit positions defining said page of data is located at said absolute address, said page counter changing the count one number unit for each propagation movement of said bit positions of said plurality of minor loops and returning to said reference number when said minor loop operability identifying page of data makes a complete circuit of the absolute addresses for the bit positions of each of said minor loops to provide synchronization of said plurality of minor loops with respect to the data stored therein as represented by a magnetic domain or a void, wherein said minor loop operability identifying page of data is continuously retained either on said major propagation path or on said plurality of minor loops in the same virtual bit position therein common to each of said minor loops.

4,458,335

DETECTOR STRUCTURE FOR ION-IMPLANTED CONTIGUOUS-DISK BUBBLE DEVICES

William J. Kabelac, Morgan Hill, and Ian L. Sanders, Sunnyvale, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 1, 1983, Ser. No. 481,114

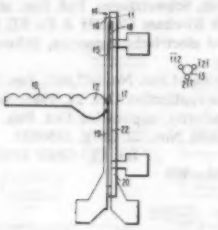
Int. Cl.³ G11C *19/08*

U.S. Cl. 365—8 **7 Claims**

1. A detector capable of two-way bubble expansion for use in ion-implanted contiguous-disk bubble devices having a nonimplanted end element, said detector comprising:

a nonimplanted bar having a first edge in spaced relation with said non-implanted end element to inhibit bubbles from passing around said end element, said bar having a second edge;

a hairpin conductor positioned over said first edge, said conductor having an outer edge aligned with said second edge; and



a thin-film magneto-resistive element associated with said conductor.

4,458,336

SEMICONDUCTOR MEMORY CIRCUIT

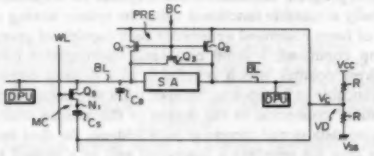
Yoshihiro Takemae, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 21, 1981, Ser. No. 313,616

Claims priority, application Japan, Oct. 22, 1980, 55-147771; Oct. 22, 1980, 55-147773

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—149 **12 Claims**



8. A semiconductor memory circuit, comprising:

a memory cell;

a first dynamic pull-up circuit operatively connected to said memory cell;

a sense amplifier operatively connected to said memory cell;

a second dynamic pull-up circuit operatively connected to said sense amplifier, one of said first and second dynamic pull-up circuits at a time performing a pull-up operation to generate a first voltage level;

a pre-charging circuit operatively connected to said sense amplifier and said first and second dynamic pull-up circuits; and

a voltage divider, operatively connected to said pre-charging circuit and said memory cell, for providing a second voltage level lower than said first voltage level.

4,458,337

BUFFER CIRCUIT

Yoshihiro Takemae, Yokohama; Shigeki Nozaki, Kawasaki; Tsutomu Mezawa, Aizuwakamatsu; Katsuhiko Kabashima, Kawasaki, and Seiji Enomoto, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 3, 1982, Ser. No. 354,498

Claims priority, application Japan, Mar. 5, 1981, 56-31752

Int. Cl.³ G11C *13/00*

U.S. Cl. 365—189 **6 Claims**

1. A buffer circuit, operatively connected to receive an external signal, first and second clock signals, and a reference voltage, for producing internal complementary outputs, comprising:

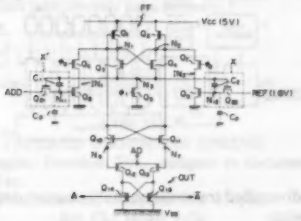
a flip-flop having a first input/output terminal and a second input/output terminal and operatively connected to receive the second clock signal;

a first input circuit, operatively connected to said first input-/output terminal and operatively connected to receive the external signal and the first clock signal, said first input circuit activated by the first clock signal and comprising:

a first transistor, operatively connected to said first input-/output terminal, having a gate for receiving the first clock signal; and

a second transistor, operatively connected in series with said first transistor, having a gate for receiving the external signal;

a second input circuit operatively connected to said second input/output terminal and operatively connected to receive the reference voltage and the first clock signal, said



second input circuit being activated by the first clock signal and comprising:

a third transistor, operatively connected to said second input/output terminal, having a gate for receiving the first clock signal; and

a fourth transistor, operatively connected in series with said third transistor, having a gate for receiving the reference voltage;

an output circuit, operatively connected to said first and second input/output terminals, for producing complementary outputs upon receipt of the second clock signal by said flip-flop; and

a first level setting device, operatively connected to the second input circuit, for supplying a voltage level to deactivate said second input circuit when said flip-flop receives the second clock signal.

4,458,338

CIRCUIT FOR CHECKING MEMORY CELLS OF PROGRAMMABLE MOS-INTEGRATED SEMICONDUCTOR MEMORIES

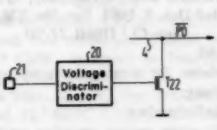
Burkhard Giebel, Munich; Hans Moormann, Haar, and Lothar Schrader, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 6, 1981, Ser. No. 290,514

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1980, 3030852

Int. Cl.³ G11C *29/00, 7/00*

U.S. Cl. 365—201 **5 Claims**



1. Circuit arrangement for checking memory cells of programmable MOS-integrated semiconductor memories, especially non-volatile semiconductor memories of the floating-gate type, having an active programming and read mode of operation, wherein all word lines of the semiconductor memory with the exception of one selected word line are at a low level, and having an inactive power-down mode of operation, wherein all word lines are at a high level, both of the modes of operation being represented by a signal having a first level for the active mode of operation and a second level for the inactive mode of operation, comprising a single circuit in the semiconductor memory switchable via a first signal indicating the operating mode for the memory cell test, wherein all of the word lines are addressed by a voltage corresponding to the programming voltage, as a function of a single, second signal fed into the semiconductor memory from the outside, from the level indicating the active mode of operation to the level indicating the inactive mode of operation, so that all the word lines can be switched simultaneously to the level required for programming.

4,458,339

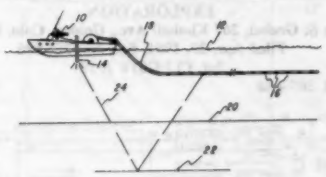
SEISMIC PROSPECTING USING A CONTINUOUS SHOOTING AND CONTINUOUS RECORDING SYSTEM

Cameron B. Wason, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 6, 1980, Ser. No. 193,998

Int. Cl.³ G01V *1/22, 1/28*

U.S. Cl. 367—14 **6 Claims**



1. A method of seismic prospecting comprising the steps of:

(a) imparting energy into the earth, the time variability of said energy being such that the power density spectrum of said energy has substantially non-zero values only at certain evenly spaced discrete frequencies,

(b) using a seismic receiver to generate an electrical signal representative of said energy after propagation through the earth, and

(c) converting a segment of said electrical signal to the frequency domain, said segment having a time duration T, wherein the frequency spacing between any adjacent pair of discrete frequencies at which said spectrum has substantially non-zero values is greater than 1/T.

4,458,340

BOREHOLE SONIC METHOD FOR POROSITY CHARACTERIZATION

Theodore V. Lautzenhiser, Tulsa, Okla., assignor to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 170,359, Jul. 21, 1980, abandoned. This application Apr. 9, 1981, Ser. No. 367,135

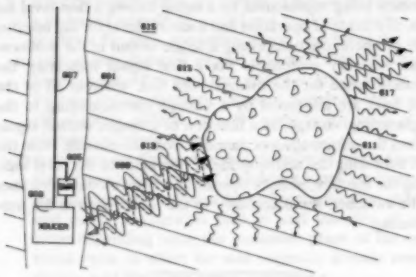
Int. Cl.³ G01V *1/40*

U.S. Cl. 367—32 **9 Claims**

1. A method for locating and characterizing porous subterranean zones, comprising the steps of:

a. transmitting an acoustical signal into a subterranean formation, said acoustical signal comprising a range of frequency components;

b. detecting resonant frequency peaks of a standing wave ratio resulting from the passage of said acoustical signal



into a porous subterranean zone in the subterranean formation; and,

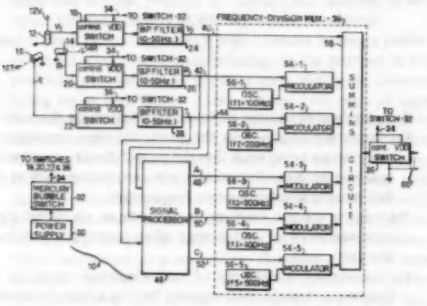
c. determining borehole formation pore size.

4,458,341

METHOD AND APPARATUS FOR SEISMIC EXPLORATION

Vaughn S. Goebel, 267 Kimball Ave., Golden, Colo. 80401

Filed Apr. 23, 1981, Ser. No. 256,896
Int. Cl.³ G01V *1/16*
U.S. Cl. 367—43 **16 Claims**



2. In a seismic system, the combination comprising,

at least one geophone for sensing seismic waves generated by a seismic energy source a spaced distance from the geophone, said geophone including,

at least two motion-sensing transducers having electrical signal outputs which include ground roll signal components, the axes of which transducers are perpendicular for detecting perpendicular components of incoming seismic waves in the directions of said axes,

signal processing means at said geophone responsive to output signals from at least said two motion sensing transducers for suppressing ground roll signal components from at least one of the transducer output signals,

remote receiver means, and

means for connecting the output from said signal processing means at said geophone to said remote receiver means,

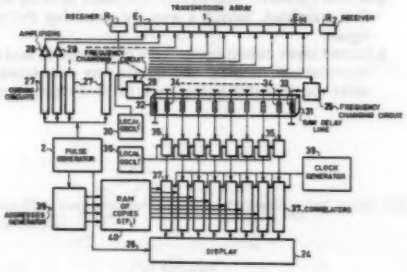
said connecting means including a multiplexer at said geophone for also connecting input signals which are supplied to said signal processing means to said remote receiver means.

4,458,342

DIVERSIFIED TRANSMISSION MULTICHANNEL DETECTION SYSTEM

Pierre Tournois, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 30, 1981, Ser. No. 316,913
Claims priority, application France, Nov. 4, 1980, 80 23519
Int. Cl.³ G01S *7/54, 15/06*
U.S. Cl. 367—88 **19 Claims**



1. A diversified transmission multi-channel detection system comprising:

transmission means for emitting signals to illuminate an angular sector of space, said transmission means including an arrangement of radiating elements positioned at the apex of said angular sector,

means for simultaneously exciting each of said radiating elements with a signal having different characteristic from the signals exciting the other radiating elements thereby enabling its identification upon reception; and

reception means for receiving and processing echos of the signals emitted by said transmission means to characterize the angular sector of space illuminated by said transmission means, said reception means including

a pair of receivers centered on said apex for detecting said echos from said sector;

channel forming means, coupled to said receivers, for forming a plurality of reception channels,

filter means, coupled to said channel forming means, said filter means being responsive to the combined illumination of said radiating elements of a particular region of said sector, and

means coupled to said filter means, for processing signals therefrom and generating information suitable for display characterizing said sector.

4,458,343

HIGH DYNAMIC COMPLIANCE HYDROPHONE WITH HYDROSTATIC PRESSURE BALANCING

Stephen W. Tehon, and Evelyn H. Monsay, both of Clay, N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,335
Int. Cl.³ H04R *23/00*
U.S. Cl. 367—149 **6 Claims**

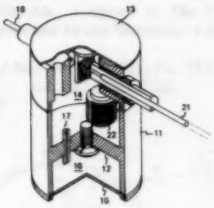
1. A hydrophone for sensing acoustic waves in a liquid medium comprising:

a. a liquid filled chamber,

b. an acoustic wave sensing member on a surface of said chamber, the internal surface of the sensing member confining the filling liquid, the external surface of the sensing member being immersed in said medium and deforming in response to acoustic waves in said medium, and

c. compliance increasing means comprising a bellows disposed in said chamber having a compliance linear compli-

ance through the range of hydrostatic pressures to which the hydrophone is to be subjected, said greater than the



filling liquid for increasing the compliance being of the hydrophone and thereby its sensitivity.

4,458,344

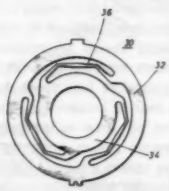
TAPERED GEOPHONE SPRING

John M. Coogler, Houston, Tex., assignor to Geosource Inc., Houston, Tex.

Filed Mar. 21, 1983, Ser. No. 477,483

Int. Cl.³ H04R *9/00*

U.S. Cl. 367—183 **8 Claims**



1. A geophone spring for suspending an inertial mass structure from a rigid support structure, said geophone spring comprising:

an outer member;

an inner member; and

a plurality of leg members connecting said outer and inner members, each of said leg members including

a substantially straight tapered segment;

an outer segment connecting the tapered segment to the outer member; and

an inner segment connecting the tapered segment to the inner member.

4,458,345

PROCESS FOR OPTICAL INFORMATION STORAGE

Gary C. Bjorklund, Los Altos, and Donald M. Burland, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1982, Ser. No. 364,160

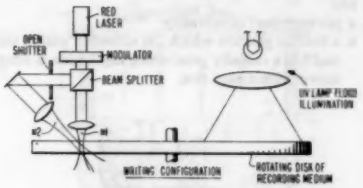
Int. Cl.³ G03C *5/04*; G11B *7/00*

U.S. Cl. 369—103 **5 Claims**

1. A process for storing information characterized by the steps of:

(1) sensitizing a recording medium comprising a two-photon, four-level material by exposing said medium to flood illumination with ultra-violet or visible light, and then

(2) exposing the sensitized medium simultaneously to two beams of coplanar laser irradiation intersecting within said



recording medium to create a microscopic interference pattern.

4,458,346

PICKUP STYLUS

Tsuneo Mitsuyu, Hirakata; Hisamitsu Maeda, Moriguchi, and Kiyotaka Wasa, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 9, 1981, Ser. No. 319,279

Claims priority, application Japan, Nov. 17, 1980, 55-162411; Nov. 17, 1980, 55-162412

Int. Cl.³ C23C *15/00*; G11B *11/06*; H04N *5/76*

U.S. Cl. 369—126 **29 Claims**

1. A pickup stylus comprising a diamond substrate of stylus body and a conductive layer formed on a selected face of the diamond substrate, in which said conductive layer is formed directly on said selected face with an interface layer inbetween, said interface layer having a roughened front formed on said selected face of the diamond substrate and also having concave spaces on said roughened front filled with the conductive layer.

4,458,347

RECORD CENTERING AND DECOUPLING DEVICES FOR TURNTABLES

Thomas A. Darnall, Jr., Rte. 6, Box 404, Buckhannon, W. Va. 26201

Continuation-in-part of Ser. No. 148,292, May 9, 1980, Pat. No. 4,368,530, which is a division of Ser. No. 904,788, May 11, 1978, Pat. No. 4,202,551. This application Sep. 8, 1982, Ser. No. 416,036

Int. Cl.³ G11B *3/62*

U.S. Cl. 369—270 **1 Claim**

1. In a turntable comprising a rotational mechanism, a platter which supports a record being played thereon, and a spindle which is connected to said mechanism, said spindle being stub-like and having a top which is below the upper surface of said platter, a record centering and decoupling device comprising:

A. a means for centering a record in relation to said spindle;

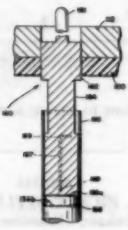
B. means for selectively and coaxially attaching said centering means to said spindle; and

C. a means for selectively decoupling said centering means from said record during play thereof,

wherein said centering means, said attaching means, and said

decoupling means are, in combination, a double-diameter centering and detaching device which comprises:

1. a tube having a circular side, with a curved slot therein and within which the top of said stub-like spindle fits; and
2. a pin member, comprising:
   a. a bottom portion which fits slideably within said tube and has a radially protruding lug which is adapted to move within said slot,



   b. a smaller-diameter portion which is coaxially attached to said bottom portion,
   c. a larger-diameter portion, which is coaxially attached to said smaller-diameter portion and fits closely within the center hole of said record, and
   d. a handle which is attached to said larger-diameter portion and protrudes above said record while said device is in both its load and play positions.

4,458,348

ELECTRICALLY PROGRAMMABLE READ ONLY MEMORY HAVING REDUCED LEAKAGE CURRENT

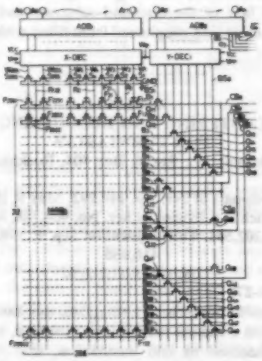
Minoru Fukuda, Tokyo; Shigeru Yamatani, Fuchu; Kotaro Nishimura, Kodaira, and Akira Endo, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 21, 1982, Ser. No. 380,775

Claims priority, application Japan, May 22, 1981, 56-76519

Int. Cl.³ G11C *7/00, 11/40*

U.S. Cl. 365—185 **15 Claims**



1. In an electrically programmable read only memory comprising:

a first plurality of non-volatile memory elements each including a source, a drain and a control gate, the gates of which are commonly connected to a first word line,

the improvement comprising:

a first switch MISFET, at least one of source electrodes of said first plurality of said non-volatile memory elements being connected to a reference potential through a drain-source path of said first switch MISFET, a gate electrode of said first switch MISFET being connected to said first word line.

4,458,349

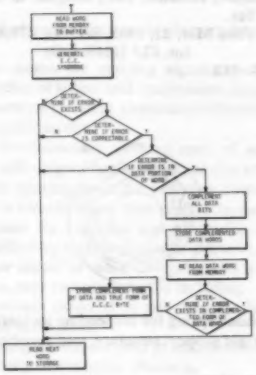
METHOD FOR STORING DATA WORDS IN FAULT TOLERANT MEMORY TO RECOVER UNCORRECTABLE ERRORS

Frederick J. Aichelmann, Jr., Hopewell Junction, and Lawrence K. Lange, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,830

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—13 **7 Claims**



1. A method for operating a memory system which includes an associated error correcting system which functions to automatically correct n bit errors in any bit position(s) of a data word read from memory where n is an integer equal to one or greater, said method being operable to reduce the probability that a data word read from memory will not be correctable because it contains n+1 bit errors, said method being characterized by the following steps:

(1) storing a data word comprising a data portion and a check byte portion in said memory;

(2) reading said data word from said memory to permit said ECC system to generate a syndrome byte;

(3) determining by processing said syndrome byte whether said data word contains an n bit error and the position of said error(s) in said data word;

(4) complimenting the data portion of said data word when said data portion contains said error;

(5) storing said data portion in complimentary form in said memory when it contains an error and storing said check byte in said memory in true form so that on a subsequent transfer of that data word from memory an indication is provided by the ECC system that said data word contains an uncorrectable error; and

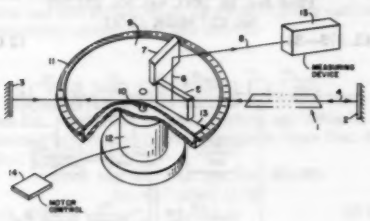
(6) recomplimenting said data portion in response to said indication during said subsequent transfer.

4,458,350

VARIABLE OUTPUT COUPLER FOR LASER CAVITIES WITH TOTALLY REFLECTING MIRRORS

Herbert B. Holl; Thomas G. Roberts, and Thomas A. Barr, Jr., all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 26, 1979, Ser. No. 78,996
Int. Cl.³ H01S 3/08
U.S. Cl. 372—108 4 Claims



1. An output coupler of a laser having a main laser beam comprising a beam splitter located within the main beam of said laser; a front and a back side being part of said splitter; a portion of the laser beam being split by the front side of said beam splitter; rotation means having said beam splitter mounted thereon; a reflecting means mounted on said rotation means spaciously from said beam splitter so as to reflect the portion of the main beam of the laser that is split by said beam splitter; said portion of the laser beam being split is an output of said splitter; measurement means located remote from said rotation means; said measurement means being positioned to receive reflections from said reflecting means; said rotation means being selectively rotated so that said beam splitter will have an output that varies with the rotation of said rotation means; said measurement means measuring the output; said rotation means rotates about a center point; said beam splitter and said reflecting means being aligned towards said center point such that an angle if formed between the beam splitter and the reflecting means if they were extended to the center point.

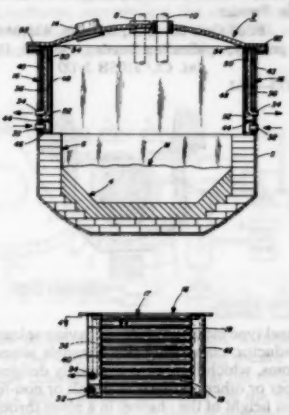
4,458,351

MEMBRANE COOLING SYSTEM FOR METALLURGICAL FURNACE

Raymond E. Richards, 36227 Ridge Rd., Willoughby, Ohio 44094

Filed Apr. 6, 1981, Ser. No. 247,141
Int. Cl.³ F27D 1/12
U.S. Cl. 373—76 15 Claims

1. A metallurgical furnace, such as an electrical arc furnace, of the type having a water cooling system, the improvement comprising a membrane cooling panel construction made from a plurality of individual cooling panel sections, said panel sections being disposed in end-to-end relationship and oriented circumferentially to define an inner exposed hot wall surface, each panel section comprising a plurality of generally cylindrical cooling tubes disposed in substantially parallel, juxtaposed relation and being spaced laterally apart a distance sufficient to define a lateral spacement area therebetween, said cooling tubes being oriented circumferentially to define said hot wall surface, spacer bar means disposed in generally centered relation in the spacement area between adjacent of said cooling tubes, said spacer bar means having a widthwise dimension sufficient to provide a trough-like recess therebetween, said spacer bar means acting to hold the individual cooling tubes out of contacting relationship with one another, weldments joining the associated spacer bar means with the adjacent surfaces of the respective cooling tubes to provide a substantially continuous, undulating membrane surface exposed to the



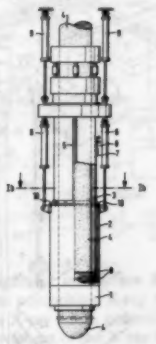
furnace melt, and a source of cooling fluid for delivering a cooling fluid to said cooling tubes.

4,458,352

METHOD AND DEVICE PROVIDING MOBILITY TO A CONTACT SHOE INDEPENDENT OF AN ELECTRODE IN AN ELECTRIC-ARC FURNACE

Frans H. Tuovinen, Ulvila, Finland; Risto M. Heikkilä, Hsparanda, Sweden; Martti J. Jaakkila, Kiviranta, Finland; Bengt J. F. Norrman, Helsinki, Finland, and Matti E. Honkaniemi, Tornio, Finland, assignors to Outokumpu Oy, Outokumpu, Finland

Filed Jan. 4, 1982, Ser. No. 336,931
Int. Cl.³ H05B 7/11, 7/12
U.S. Cl. 373—101 8 Claims



4. A device for providing mobility to a contact shoe independent of an electrode in an electric-arc furnace, comprising:

(a) a contact shoe supporting mantle having an inner member and a mobile outer member detachably attached to and telescopically fitted over said inner member;

(b) said inner member having an inner and an outer surface and containing the electrode;

(c) said outer member having a lower end and an upper end and having the contact shoe attached to the lower end; and

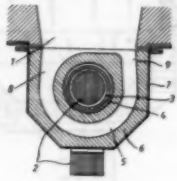
(d) means for telescopically lifting said outer member and the contact shoe attached thereto over said inner member.

4,458,353

CHANNEL-TYPE INDUCTION FURNACE

Tallbäck Göte, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Oct. 18, 1982, Ser. No. 435,044
Claims priority, application Sweden, Oct. 20, 1981, 8106184
Int. Cl.³ H05B *5/00*
U.S. Cl. 373—161 **3 Claims**



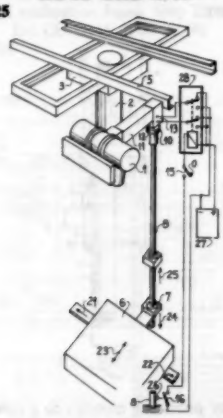
1. Channel type induction furnace having at least one closed-channel inductor, comprising side channels joined together at their bottoms, which furnace is especially designed for aluminum, copper or other non-ferrous metals or non-ferrous alloys, the smallest height of the channel in a plane through the longitudinal axis of the primary coil being at least $4\times\delta$, where δ is the depth of penetration into the melt of the current induced in the channel, and the smallest width of the channel being at least $6\times\delta$, so as to avoid substantial influence on the melt flow in the channel, caused by the pinch effect.

4,458,354

COUPLING DEVICE FOR COUPLING A RONTGEN TUBE-HOLDER TO THE FRAME OF AN IMAGE RECEIVER IN A TOMOGRAPH

Joseph Munch, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 4, 1982, Ser. No. 385,290
Claims priority, application Belgium, Jun. 10, 1981, 889156
Int. Cl.³ G03B *41/16*
U.S. Cl. 378—25 **4 Claims**



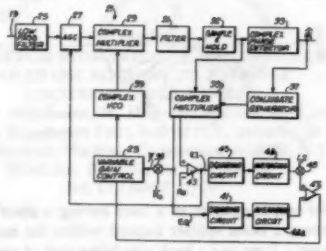
1. In a coupling for coupling the Röntgen tube-holder to the image receiver in a tomograph, namely a coupling link coupled between the frame of the image receiver and the Röntgen tube-holder for synchronously moving the image receiver and the Röntgen tube-holder, one end of said coupling link having one non uncouplable end and the other end having an uncouplable coupling, said uncouplable coupling is a permanent electromagnetic coupling, wherein said permanent electromagnetic coupling comprises a coupling pin placed at the upper end of the coupling link and a permanent electromagnet placed in a case which may pivot with respect to the Röntgen tube-holder and wherein the coupling pin in the coupled position is pushed into the central hole of said permanent electromagnet and is held there.

4,458,355

ADAPTIVE PHASE LOCK LOOP

David M. Motley, Santa Ana, and Naif D. Salman, Orange, both of Calif., assignors to Hycom Incorporated, Irvine, Calif.

Filed Jun. 11, 1981, Ser. No. 272,707
Int. Cl.³ H03K *13/32*
U.S. Cl. 375—82 **12 Claims**



1. An apparatus for processing an information signal representative of information and containing error, including phase error, wherein a detector detects the information in the signal, an error signal representative of the error is generated and a phase lock loop is responsive to at least a portion of the error signal to tend to reduce the phase error, the improvement comprising:

variable gain means for adjusting the gain of the phase lock loop;

gain control means in the phase lock loop responsive to at least a portion of the error signal for providing a gain adjustment signal to the variable gain means to adjust the gain of the latter; and

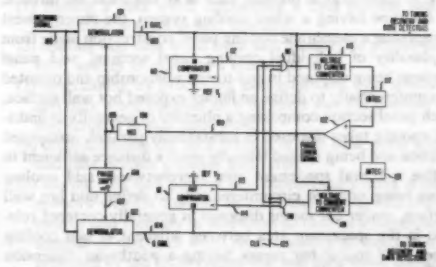
said gain control means increases the gain of the variable gain means in response to phase jitter having a greater influence on the error signal than noise has on the error signal.

4,458,356

CARRIER RECOVERY CIRCUIT

William W. Toy, Eatontown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 2, 1982, Ser. No. 394,848
Int. Cl.³ H04L *27/00*
U.S. Cl. 375—120 **10 Claims**



10. A carrier recovery circuit for use within the receiver of a digital transmission system wherein channels of data are

formed by demodulating quadrature-related carriers using locally-generated quadrature-related carriers, said circuit comprising

means for comparing the data in said channels to associated channel thresholds;

first means responsive to a first result of said comparisons for integrating the data in a preselected channel;

second means responsive to a different result of said comparisons for integrating the data in said preselected channel; and

means responsive to the data integrated in response to said first and said second result for phase aligning said locally-generated carriers with said carriers.

4,458,357

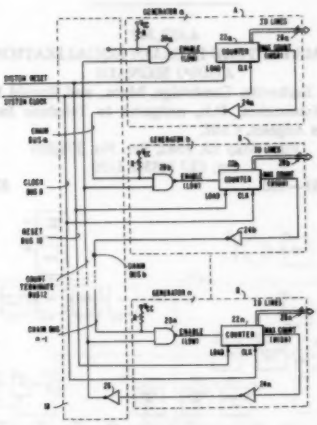
CIRCUIT BOARD IDENTITY GENERATOR

William M. Weymouth, Fountain Valley, and Dilip C. Shah, Mission Viejo, both of Calif., assignors to Basic Four Corporation, Tustin, Calif.

Filed Aug. 17, 1981, Ser. No. 293,503

Int. Cl.³ G06F *13/00*

U.S. Cl. 377—2 **14 Claims**



1. A system for identifying a succession of circuit boards each having an identity generator including counter means for counting in accordance with a clock signal when enabled for providing a count output, said system comprising:

means for automatically enabling said counter means in each of said identity generators in a predetermined succession; and

means for automatically disabling said counter means in each of said identity generators at substantially the same time, whereby said count output from each of said identity generators provides a unique identification number for an associated one of said circuit boards.

4,458,358

REFERENCE DETECTOR DEVICE FOR A MULTIDETECTOR TOMODENSITOMETER AND TOMODENSITOMETER COMPRISING SUCH A DEVICE

Remy Klausz, Paris, France, assignor to Thomson-CSF, Paris, France

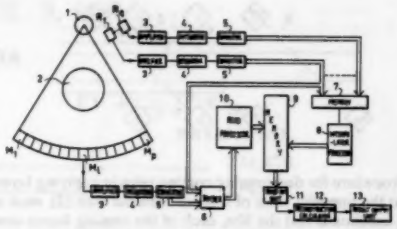
Filed Dec. 21, 1982, Ser. No. 451,799

Claims priority, application France, Jan. 8, 1982, 82 00237

Int. Cl.³ A61B *6/00*

U.S. Cl. 378—19 **15 Claims**

1. A reference detector device for a multidetector tomodensitometer, said device comprising, for the purpose of obtaining at any point of a section of an object the measurement of the radiologic density of said object, a source of X-rays and measuring detectors and said device also comprising a plurality of reference detectors, filtering means whereby it is possible to obtain at each of the reference detectors a beam measurement in spectral conditions reproducing the attenuation of these X-rays by current objects which are to be analysed, each of the reference detectors being associated with one of said filtering



means, means for measuring the incident X-radiation after attenuation by the said associated filtering means; means for instantaneously combining values found at the different reference detectors whilst making allowance for the value of the measurements at the measurement point in question; and means for generating a reference signal value derived from this combination of values.

4,458,359

X-RAY DIAGNOSTIC INSTALLATION FOR X-RAY TOMOGRAPHIC IMAGES

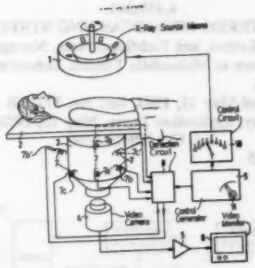
Hartmut Sklebitz, Erlangen, and Wolfgang Maass, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 25, 1983, Ser. No. 469,980

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1982, 3207816

Int. Cl.³ A61B *6/00*; H01J *31/50*; H05G *1/64*

U.S. Cl. 378—22 **2 Claims**



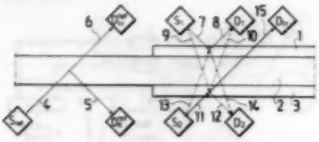
1. An X-ray diagnostic installation for producing X-ray tomographic images, comprising X-ray source means (1) for the generation of an X-ray beam, control generator means (9) for effecting the movement of the X-ray beam for the purpose of irradiating the patient from respective beam directions, a patient support (2), an X-ray image intensifier (3) having deflection coil means (7), deflection circuit means (8), connected to the control generator means (9) and with the deflection coil means for effecting movement of the electron image in the X-ray image intensifier (3) sychronously with the changing of the beam direction of the X-ray source means, and a television chain (4 through 6), coupled to the output of the X-ray image intensifier (3), characterized in that the deflection coil means (7) comprises n coil pairs offset relative to one another by 360°/n in one plane, where n amounts at least to three, and that the deflection circuit means (8) is so designed that the deflection current flows only in two of the n coil pairs, respectively.

4,458,360

PROCEDURE FOR DETERMINING COATING RATES

Heikki Venäläinen, Rauha, and Rauno Rantanen, Imatra, both of Finland, assignors to Enso-Gutzeit Oy, Finland

Filed May 26, 1982, Ser. No. 382,242
Int. Cl.³ G01N *23/22*
U.S. Cl. 378—50 4 Claims



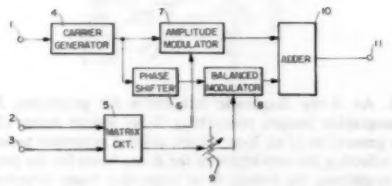
1. Procedure for determining coating rates in applying layers (1,3) to the opposite sides of a paper material web (2), such as paper, cardboard and the like, each of the coating layers containing the same component which emits characteristic fluorescent radiation, including the steps of directing primary radiation from one of a radiating isotope and an X-ray tube against the coated web, exciting fluorescent radiation in the coating layers based on the directed primary radiation, and measuring the intensity of the fluorescent radiation emitted as a result of the directed primary radiation, wherein the improvement comprises arranging two mutually functionally dependent primary radiation source/fluorescent radiation detector pairs (S_1,D_1 and S_2,D_2) each on an opposite side of the coated paper material web (2), and separately directing primary radiation from each of said radiation sources (S_1,S_2) into the coated paper material web so that each source excites fluorescent radiation in both of the coating layers, and measuring the added intensity of the fluorescent radiation from both coating layers with each corresponding detector (D_1,D_2) of the radiation source/detector pairs so that the coating rates are calculable from the measurement of the fluorescent radiation obtained and from the base weight of the paper material web.

4,458,361

AM STEREO BROADCASTING SYSTEM

Kenzo Tanabe, Katano, and Toshikazu Nezu, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 11, 1982, Ser. No. 377,248
Claims priority, application Japan, May 15, 1981, 56-73720
Int. Cl.³ H04H *5/00*
U.S. Cl. 381—15 6 Claims



1. An AM stereo broadcasting system for transmitting and receiving left and right stereo signals respectively denoted L and R, said system having a transmitter comprising:

a carrier signal generating means for generating a pair of carrier signals having the same frequency but differing in phase by 90°;

a sum-difference means for generating the sum and differences of said left and right stereo signals respectively denoted (L+R) and (L−R);

an amplitude modulator means operatively connected to said carrier signal generating means and said sum-difference means for amplitude modulating one of said pair of carrier signals by said (L+R) signal;

an attenuator means operatively connected to said sum-difference means for multiplying said (L−R) signal by a constant l, wherein $1 \leq l$ so as to generate a signal l(L−R);

a balanced modulator means operatively connected to said carrier signal generating means and said attenuator means for modulating a second of said pair of carrier signals by said l(L−R) signal;

an adder means operatively connected to said amplitude and balanced modulator means for adding outputs from said amplitude and balanced modulator means so as to thereby produce a transmitted signal;

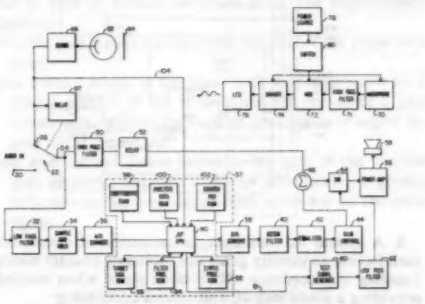
wherein said carrier signal generating means further comprises a means for angle modulating said pair of carrier signals by a single sinusoidal signal with the same modulation index, said sinusoidal signal having a frequency which is lower than that of a frequency band of said L and R signals.

4,458,362

AUTOMATIC TIME DOMAIN EQUALIZATION OF AUDIO SIGNALS

Robert A. Berkovitz, Cambridge, Mass., and Ronald P. Genereux, Woonsocket, R.I., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed May 13, 1982, Ser. No. 378,009
Int. Cl.³ H03G *5/00*
U.S. Cl. 381—103 32 Claims



1. A digital discrete time filtering system for use in apparatus for modifying the audio response of at least a selected portion of a sound reproduction system with respect to analog audio signals intended to be reproduced; which apparatus includes means for introducing a test signal into said portion, and means for detecting the test signal as transmitted through said portion; said filtering system comprising in combination:

means for generating, responsively to the detected test signal, a corresponding time-sampled sequence of values;

digital computer means programmed for generating from said sequence, a set of digital filter coefficients for said filtering system;

means for storing said coefficients;

means for digitizing said audio signals;

said digital computer means also being programmed for convolving the stored coefficients with the digitized audio signals; and

means for converting the convolved digitized audio signals to analog form.

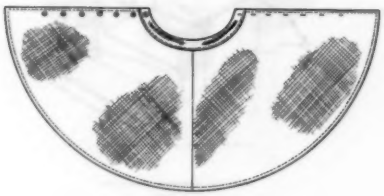
DESIGN PATENTS

GRANTED JUL. 3, 1984

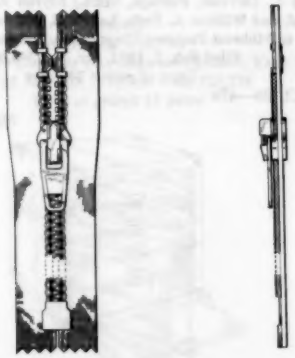
ERRATA

For CLASS	See PATENT NO.
D22–023	274,479
D08–356	274,487

274,479
SKIRT
Fran Petillo, New York, N.Y., assignor to General Mills, Inc., Minneapolis, Minn.
Filed Jul. 6, 1981, Ser. No. 282,333
Term of patent 14 years
U.S. Cl. D2—223



274,480
SLIDE FASTENER
Yoshihiro Kanzaka, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan
Filed Jan. 27, 1981, Ser. No. 229,000
Claims priority, application Japan, Jul. 29, 1980, 55-30796
Term of patent 14 years
U.S. Cl. D2—415



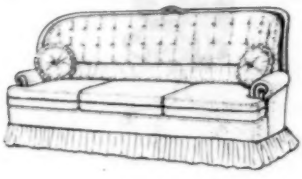
274,481
SUITCASE
André G. Seynhaeve, Bobigny, France, assignor to Societe Delsey, Bobigny, France
Filed Dec. 30, 1981, Ser. No. 335,838
Claims priority, application France, Jul. 31, 1981, 812710
Term of patent 14 years
U.S. Cl. D3—76

274,482
SEAT
John W. Caldwell, San Marino, Calif., assignor to Pacific Furniture Mfg. Co., Compton, Calif.
Filed Jul. 6, 1981, Ser. No. 280,731
Term of patent 14 years
U.S. Cl. D6—366

274,483
SEAT
Jerome Caruso, Lake Forest, Ill., assignor to Litton Business Systems, Inc., York, Pa.
Continuation of Ser. No. 142,259, Apr. 21, 1980. This application Feb. 25, 1983, Ser. No. 470,023
Term of patent 14 years
U.S. Cl. D6—366

274,484
STOOL
Robert Aronowitz, 40 E. 84th St., New York, N.Y. 10028, and Bernard Katzanek, 100 Caton Ave., Brooklyn, N.Y. 11218
Filed Jan. 25, 1982, Ser. No. 342,573
Term of patent 14 years
U.S. Cl. D6—366

274,485
SEAT
Gary A. Huffstetler, Lenoir, N.C., assignor to Broyhill Furniture Industries, Inc., Lenoir, N.C.
Filed May 19, 1983, Ser. No. 496,050
Term of patent 14 years
U.S. Cl. D6—381

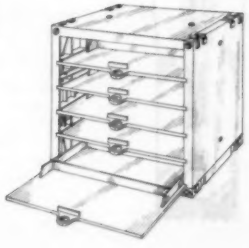


274,486
SHOWER SHELF
Bruce R. Thompson, 32 Shakespeare Ave., Tranmere, South Australia, Australia
Filed Dec. 3, 1982, Ser. No. 446,854
Claims priority, application Australia, Oct. 12, 1982, 1819/82
Term of patent 14 years
U.S. Cl. D6—525

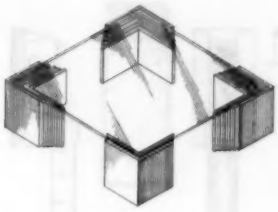
274,487
HOSE HANGER
Harold O. Eads, Parkersburg, W. Va., and Ronald R. Fowler, Coolville, Ohio, assignors to O. Ames Co., Parkersburg, W. Va.
Filed Mar. 29, 1982, Ser. No. 363,373
Term of patent 14 years
U.S. Cl. D8—356

274,488
BED TRAY
Robert T. Howitt, Leominster, Mass., assignor to Frem Corporation, Worcester, Mass.
Filed Sep. 29, 1982, Ser. No. 428,364
Term of patent 14 years
U.S. Cl. D6—406

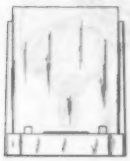
274,489
COMBINED STORAGE AND DISPLAY CABINET FOR FASTENERS
Henry L. DeVries, Portage, Mich.; Myron A. Roth, Jr., St. Paul, and William A. Roth, Lakeland, both of Minn., assignors to Midwest Fastener Corporation, Kalamazoo, Mich.
Filed Feb. 2, 1982, Ser. No. 345,036
Term of patent 14 years
U.S. Cl. D6—476



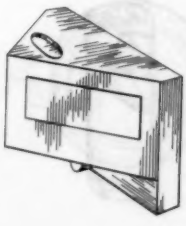
274,490
COFFEE TABLE
Demir Hamami, 2724 Briggs Chaney Rd., Silver Spring, Md. 20904
Filed Mar. 29, 1982, Ser. No. 363,242
Term of patent 14 years
U.S. Cl. D6—484



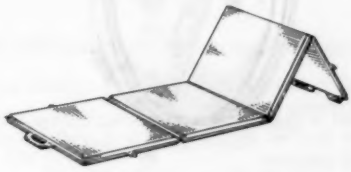
274,491
DISPLAY STAND
Gary W. Lietzke, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.
Filed Mar. 15, 1982, Ser. No. 358,223
Term of patent 14 years
U.S. Cl. D6—485



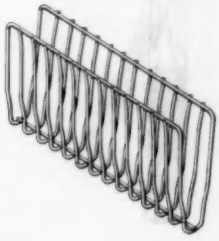
274,492
DRAWER FRONT
Hal Sandy, 4937 Glendale Rd., Shawnee-Mission, Kans. 66205
Filed Nov. 20, 1981, Ser. No. 323,278
Term of patent 14 years
U.S. Cl. D6—494



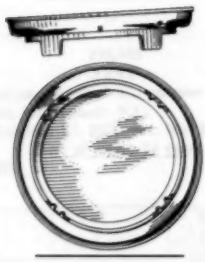
274,493
RECLINABLE SELF-SUPPORTING BEACH MAT
Knud D. Dyby, 191 Golden Hind Passage, Corte Madera, Calif. 94925
Continuation-in-part of Ser. No. 127,109, Mar. 4, 1980. This application Dec. 21, 1981, Ser. No. 332,928
Term of patent 14 years
U.S. Cl. D6—392



274,494
TACO SHELL MOLD
Marvin C. Bonine, Menlo Park, Calif., assignor to Calny, Inc., San Mateo, Calif.
Filed Nov. 23, 1981, Ser. No. 324,197
Term of patent 14 years
U.S. Cl. D7—43

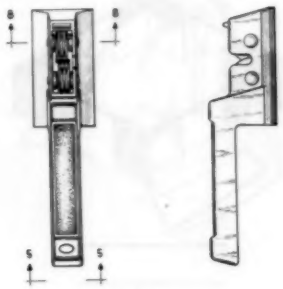


274,495
COMBINED MICROWAVE BASE AND PAN FOR PIZZA MAKER
Robert F. Bowen, Burlington; Thomas J. Martel, North Reading, and Charles G. Fink, Cohasset, all of Mass., assignors to Raytheon Company, Lexington, Mass.
Filed Nov. 16, 1981, Ser. No. 321,353
Term of patent 14 years
U.S. Cl. D7—354



274,496
HAMMER
Donald D. Grover; David J. Draeger, and Frank Mikic, all of Kenosha, Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.
Filed May 22, 1981, Ser. No. 266,196
Term of patent 14 years
U.S. Cl. D8—77

274,497
KNIFE SHARPENER
Herbert E. Zabel, Wheaton, and Casimir Gruska, Park Ridge, both of Ill., assignors to American Home Products Corporation, New York, N.Y.
Filed Feb. 22, 1982, Ser. No. 351,191
Term of patent 14 years
U.S. Cl. D8—93



274,498
SWIVEL SUPPORT FOR A SNOW MAKING MACHINE
Robert M. Ash, P.O. Box 364, Banner Elk, N.C. 28604
Filed Jun. 18, 1982, Ser. No. 389,685
Term of patent 14 years
U.S. Cl. D8—349

274,499
LIQUID DISPENSING CONTAINER
Vili Soos, Toronto, Canada, assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Jan. 19, 1982, Ser. No. 340,629
Claims priority, application Canada, Nov. 30, 1981, 30-11-81-13
Term of patent 14 years
U.S. Cl. D9—300

274,500
BOTTLE
Peter S. Sephton, Halifax, Canada, assignor to 501 Schwartz Inc., Halifax, Canada
Filed Mar. 11, 1982, Ser. No. 357,291
Claims priority, application Canada, Nov. 18, 1981, 18-11-81-3
Term of patent 14 years
U.S. Cl. D9—355

274,501
BOTTLE
Paul R. Campbell, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed May 3, 1982, Ser. No. 373,820
Term of patent 14 years
U.S. Cl. D9—349

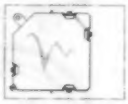
274,502
LID FOR DISPOSABLE BEVERAGE CONTAINERS
Harvey J. Little, 2490 Middlefield Rd., Trenton, Mich. 48183
Filed Apr. 7, 1982, Ser. No. 366,140
Term of patent 14 years
U.S. Cl. D9—438

274,503
WRIST-WATCH WITH BRACELET
Giovanni Bulgari, Rome, Italy, assignor to Anthos S. A., Geneva, Switzerland
Filed Dec. 18, 1981, Ser. No. 332,225
Claims priority, application Hague, Jun. 25, 1981, DM/000 832
Term of patent 14 years
U.S. Cl. D10—32

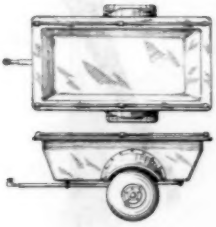
274,504
WRIST-WATCH WITH BRACELET
Giovanni Bulgari, Rome, Italy, assignor to Anthos S.A., Geneva, Switzerland
Filed Dec. 18, 1981, Ser. No. 332,226
Claims priority, application Hague, Jun. 25, 1981, DM/000 833
Term of patent 14 years
U.S. Cl. D10—32

274,505
AUTOMOTIVE GAUGE HOUSING
John V. Westberg, 413 W. Elm St., Sycamore,, Ill. 60178
Filed Apr. 19, 1982, Ser. No. 369,776
Term of patent 14 years
U.S. Cl. D10—102

274,506
UNIPOLAR CHAMBER FOR AN IONIZATION SMOKE DETECTOR
Richard E. Hiltenbrand, Naperville, IL, assignor to Pittway Corporation, Aurora, Ill.
Filed Feb. 10, 1982, Ser. No. 347,528
Term of patent 14 years
U.S. Cl. D10—121

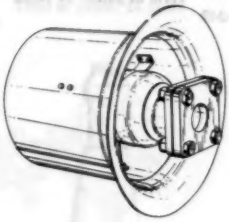


274,507
VEHICLE TRAILER
Eugene L. Wilson, 19696 Mahogany, Bend, Oreg. 97702
Filed Apr. 5, 1982, Ser. No. 365,364
Term of patent 14 years
U.S. Cl. D12—105



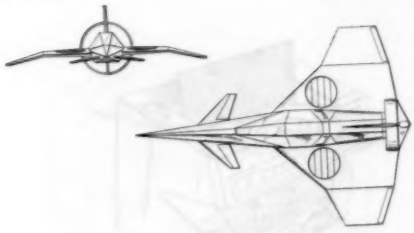
274,508
AUTOMOBILE BUMPER
Toshio Yamashita, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Sep. 30, 1982, Ser. No. 430,127
Term of patent 14 years
U.S. Cl. D12—169

274,509
MULTIGAP FUME DILUTER
Derek L. Aldred, Dipton, England, assignor to Haskel Energy Systems Ltd., Sunderland, England
Filed Oct. 28, 1981, Ser. No. 315,746
Term of patent 14 years
U.S. Cl. D12—194

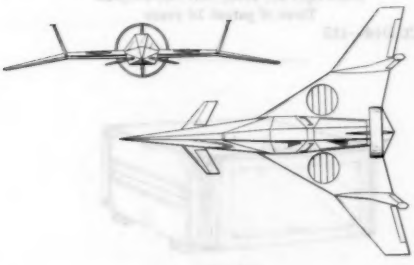


274,510
AIRCRAFT
Jean McComas, West Babylon, and Gordon Rosenthal, Jericho, both of N.Y., assignors to Fairchild Industries, Inc., Germantown, Md.
Filed Feb. 18, 1982, Ser. No. 349,793
Term of patent 14 years
U.S. Cl. D12—338

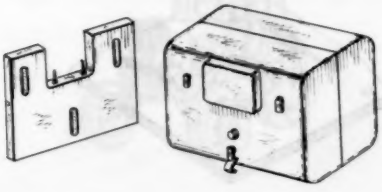
274,511
VERTICAL/SHORT TAKE-OFF/LANDING AIRCRAFT
Robert T. Clifton, 7999 Hansen#420, Houston, Tex. 77061
Filed Mar. 1, 1982, Ser. No. 353,629
Term of patent 14 years
U.S. Cl. D12—330



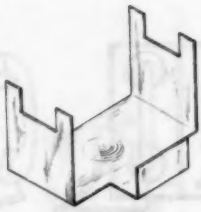
274,512
VERTICAL/SHORT TAKE-OFF/LANDING AIRCRAFT
Robert T. Clifton, 7999 Hansen #420, Houston, Tex. 77061
Filed Mar. 1, 1982, Ser. No. 353,630
Term of patent 14 years
U.S. Cl. D12—330



274,513
BATTERY CASE
James Frezzolini, 27 Kraft Pl., Ringwood, N.J. 07456
Filed Aug. 20, 1981, Ser. No. 294,462
Term of patent 14 years
U.S. Cl. D13—8

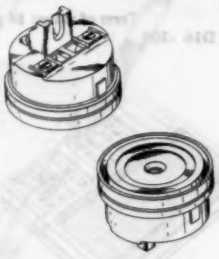


274,514
COMBINED HOLDER/CONTACT FOR A SINGLE-CELL BATTERY
Larry E. Thompson, 3505 Rochelle Rd., Irving, Tex. 75062
Filed Feb. 8, 1982, Ser. No. 346,408
Term of patent 14 years
U.S. Cl. D13—10

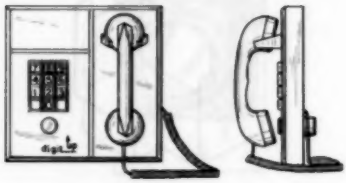


274,515
TELEPHONE SET
Herbert Kraemer, Fuerstenfeldbruck, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed Sep. 15, 1980, Ser. No. 187,181
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 12093
Term of patent 14 years
U.S. Cl. D14—58

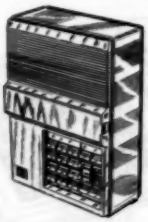
274,516
TELEPHONE HANDSET TRANSMITTER CUP
Wesley F. Walker, Jr., Ringgold, Ga., assignor to Walker Equipment Corporation, Ringgold, Ga.
Filed Feb. 8, 1982, Ser. No. 346,823
Term of patent 14 years
U.S. Cl. D14—67



274,517
INTERCOM
Justin J. Monahan, 614 N. Kings Way Rd., #39, Seffner, Fla. 33584
Filed Apr. 24, 1981, Ser. No. 257,192
Term of patent 14 years
U.S. Cl. D14—92

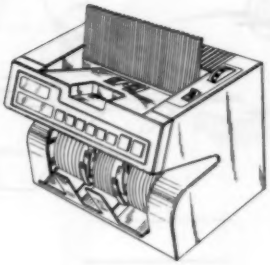


274,518
INTERCOMMUNICATION APPARATUS
Peter J. Doodson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 22, 1982, Ser. No. 350,836
Claims priority, application Benelux, Sep. 4, 1981, 56037-00
Term of patent 14 years
U.S. Cl. D14—92

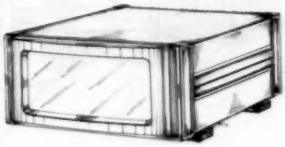


274,519
ENCODING TERMINAL
Ronald M. Pontefract, York, England, assignor to Rowntree Mackintosh Limited, York, England
Filed Dec. 3, 1981, Ser. No. 327,042
Claims priority, application United Kingdom, Jun. 16, 1981, 1001003
Term of patent 14 years
U.S. Cl. D14—100

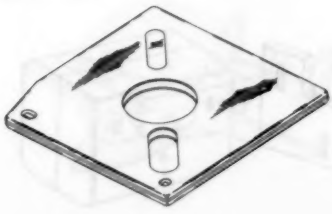
274,520
PAPER AND DOCUMENT HANDLING APPARATUS
Peter Bressler, Philadelphia, Pa., assignor to Brandt, Inc., Watertown, Wis.
Filed Sep. 28, 1981, Ser. No. 305,991
Term of patent 14 years
U.S. Cl. D14—110



274,521
CATHODE RAY TUBE DISPLAY HOUSING FOR ELECTRONIC INSTRUMENTS
George L. McCain, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.
Filed Apr. 29, 1982, Ser. No. 373,008
Term of patent 14 years
U.S. Cl. D14—113



274,522
FLEXIBLE MAGNETIC DISK CARTRIDGE
Kneale, Collan B., Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 5, 1982, Ser. No. 355,003
Term of patent 14 years
U.S. Cl. D14—114

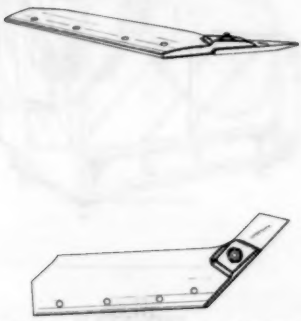


274,523

PLOWSHARE WITH A REPLACEABLE MEMBER

Olav Nja, Kvernaland, Norway, assignor to Kverneland A/S, Kvernaland, Norway

Filed Mar. 10, 1981, Ser. No. 242,241
Claims priority, application Norway, Sep. 11, 1980, 61322
Term of patent 14 years
U.S. Cl. D15—11



274,524

ALL-PURPOSE ROW-CROP WHEEL TRACTOR

Stepan E. Koval, pereulok Pikhtovy, 3, kv. 40; Oleg D. Tkachenko, pereulok Pikhtovy, 7, kv. 29; Vladimir V. Baranov, prospekt K. Marxa, 113, kv. 33; Alexandr I. Kedik, ulitsa Titova, 23, kv. 54; Valentin A. Artemenko, ulitsa Bolshevistskava, 1 "b", kv. 144, and Vladimir K. Drozdov, prospekt Kirova, 123, kv. 54, all of Dnepropetrovsk, U.S.S.R.

Filed May 7, 1981, Ser. No. 261,533
Term of patent 14 years
U.S. Cl. D15—23

274,525

COMBINATION BACKHOE BUCKET AND ROTARY GRINDING ASSEMBLY

Robert L. Jordan, 9426 Calvine Rd., Sacramento, Calif. 95823, and Scott J. Alford, 9403 2nd Ave., Elk Grove, Calif. 95624

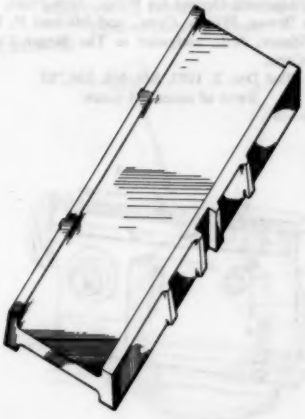
Filed Sep. 2, 1982, Ser. No. 414,218
Term of patent 14 years
U.S. Cl. D15—32

274,526

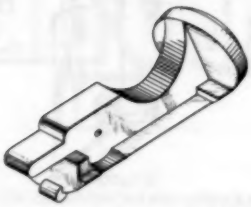
ABRASIVE BLASTING WHEEL BLADE

W. David Watts, P.O. Box 48474, Atlanta, Ga. 30362

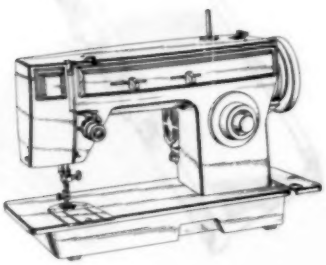
Filed Feb. 3, 1981, Ser. No. 231,256
Term of patent 14 years
U.S. Cl. D15—126



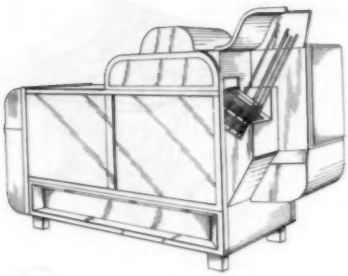
274,527
PIVOT VALVE FOR SAND-BLASTING NOZZLE AND CONTROL VALVE ASSEMBLY OR THE LIKE
George H. Huber, Jr., 807 Moores La., New Castle, Del. 19720
Filed Dec. 8, 1982, Ser. No. 449,602
Term of patent 14 years
U.S. Cl. D15—126



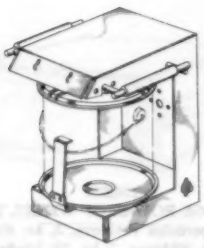
274,528
SEWING MACHINE
Jan Szostak, Lincroft; George La Police, Somerville, both of N.J.; John Brown, Wilton, Conn., and Michael P. Ballone, New Providence, N.J., assignors to The Singer Company, Stamford, Conn.
Filed Dec. 2, 1981, Ser. No. 326,715
Term of patent 14 years
U.S. Cl. D15—69



274,529
COMBINED FORMING, FILLING AND SEALING MACHINE FOR LIQUID PRODUCTS
Samuel M. Highberger, Birmingham, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.
Filed Feb. 4, 1982, Ser. No. 345,895
Term of patent 14 years
U.S. Cl. D15—145



274,530
CAN HOLDER FOR USE IN A PAINT MIXER
Tim M. Uyeda, South San Gabriel, Calif., assignor to Peerless Pressed Metal Corporation, Watertown, Mass.
Filed Jan. 29, 1982, Ser. No. 343,731
Term of patent 14 years
U.S. Cl. D15—147



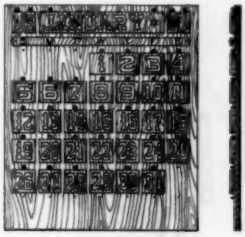
274,531
SUNGLASSES
Franz Dianitsch, Linz, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed Jul. 12, 1982, Ser. No. 397,543
Term of patent 14 years
U.S. Cl. D16—115

274,532
SUNGLASSES
Franz Dianitsch, Linz, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed Jul. 12, 1982, Ser. No. 397,544
Term of patent 14 years
U.S. Cl. D16—115

274,533
SUNGLASSES
Franz Dianitsch, Linz, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed Jul. 12, 1982, Ser. No. 397,545
Term of patent 14 years
U.S. Cl. D16—115

274,534
SPECTACLES
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica SA, Villars-Sur-Glane, Switzerland
Filed Nov. 6, 1981, Ser. No. 318,795
Claims priority, application Hague, May 8, 1981, 71414
Term of patent 14 years
U.S. Cl. D16—117

274,535
MODULAR CALENDAR
Brenda Hicks, 637 Vogel Pl., East St. Louis,, Ill. 62205
Filed Jun. 4, 1981, Ser. No. 270,557
Term of patent 14 years
U.S. Cl. D19—20



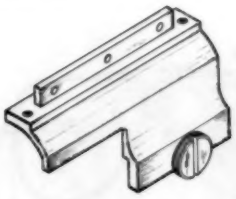
274,536
VIDEO GAME CABINET
Dale F. Rodesch, 13020 Broili Dr., Reno, Nev. 89511
Filed Mar. 22, 1982, Ser. No. 360,328
Term of patent 14 years
U.S. Cl. D21—13

274,537
NOVELTY HEADBAND
John Wolens, and Leon Levy, both of Chicago, Ill., assignors to U U Co., Inc., Chicago, Ill.
Continuation-in-part of Ser. No. 485,599, Apr. 18, 1983, abandoned.
Filed Feb. 17, 1984, Ser. No. 579,491
Term of patent 14 years
U.S. Cl. D21—59

274,538
WALL MOUNTED EXERCISER HOUSING
Richard W. Grosser, Jefferson, Iowa, assignor to AMF Inc., White Plains, N.Y.
Filed Feb. 5, 1982, Ser. No. 345,965
Term of patent 14 years
U.S. Cl. D21—195

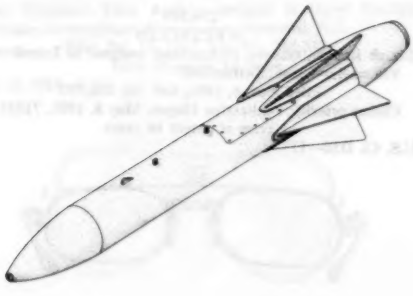
274,539
PHYSICAL EXERCISER
Jack D. Bankier, 1724 Longvalley Dr., Northbrook, Ill. 60062
Filed Jan. 11, 1982, Ser. No. 338,603
Term of patent 14 years
U.S. Cl. D21—198

274,540
SCOPE MOUNT FOR A SHOTGUN
Daniel L. Bechtel, P.O. Box 11281, Fort Worth, Tex. 76109
Filed Aug. 23, 1982, Ser. No. 410,569
Term of patent 14 years
U.S. Cl. D22—7



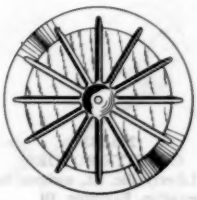
274,541
RECOIL PAD FOR GUNS
Myron L. McCone, Star Rte. 2, Rhinelander, Wis. 54501
Filed Jun. 23, 1982, Ser. No. 391,188
Term of patent 14 years
U.S. Cl. D22—9

274,542
TOWED PLUME TARGET
Hugh B. Feagle, Leeds, Ala., assignor to Hayes International Corporation, Birmingham, Ala.
Filed Feb. 10, 1982, Ser. No. 347,535
Term of patent 14 years
U.S. Cl. D22—17

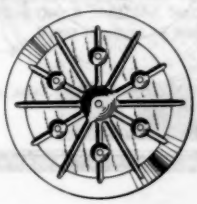


274,543
WING TIP POD PLUME TARGET FOR AIR TO AIR WEAPONRY
Hugh B. Feagle, Leeds, Ala., assignor to Hayes International Corporation, Birmingham, Ala.
Filed Mar. 8, 1982, Ser. No. 355,459
Term of patent 14 years
U.S. Cl. D22—17

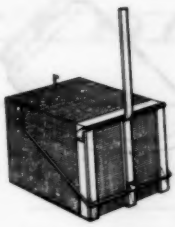
274,544
RODENTICIDE BLOCK
Robert D. Proctor, Raleigh, N.C., assignor to ICI Americas Inc., Wilmington, Del.
Filed Jun. 7, 1982, Ser. No. 385,888
Term of patent 14 years
U.S. Cl. D22—18



274,545
RODENTICIDE BLOCK
Robert C. McClelland, Wilmington, Del., and Robert D. Proctor, Raleigh, N.C., assignors to ICI Americas Inc., Wilmington, Del.
Filed Jun. 7, 1982, Ser. No. 385,889
Term of patent 14 years
U.S. Cl. D22—18

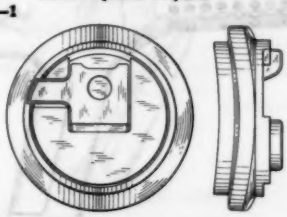


274,546
ANIMAL TRAP
Frank R. Scarpelli, 3637 N. Nottingham, Chicago, Ill. 60634
Filed Sep. 29, 1982, Ser. No. 426,850
Term of patent 14 years
U.S. Cl. D22—18

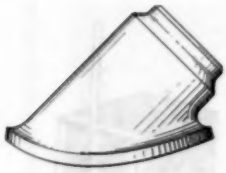


274,547
RETRIEVER FOR FISHING LURES AND THE LIKE
Joseph P. Godlewski, 4 Monastery St., Pittsburgh, Pa. 15203
Filed Mar. 29, 1982, Ser. No. 363,127
Term of patent 14 years
U.S. Cl. D22—31

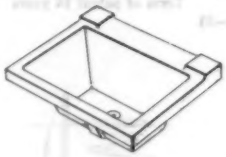
274,548
COMBINED CAP AND ADAPTER RING FOR A FUEL TANK
James R. Shaw, Amagansett, N.Y., assignor to Shaw Aero Devices, Inc., East Hampton, N.Y.
Filed Nov. 5, 1981, Ser. No. 318,426
Term of patent 14 years
U.S. Cl. D23—1



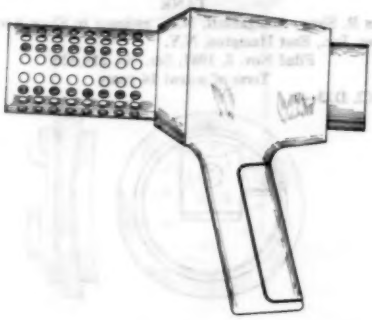
274,549
WELDING OUTLET
Bobby W. Ryan, Houston, Tex., assignor to WFI International, Inc., Houston, Tex.
Filed Jan. 21, 1982, Ser. No. 341,560
Term of patent 14 years
U.S. Cl. D23—40



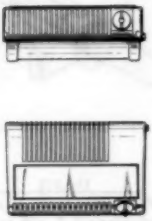
274,550
WASH BASIN
William Platka, Sylmar, Calif., assignor to Kidde Consumer Durables Corp., Bala Cynwyd, Pa.
Filed Mar. 5, 1982, Ser. No. 355,152
Term of patent 14 years
U.S. Cl. D23—58



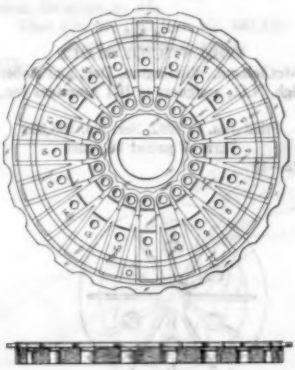
274,551
HEAT GUN
E. Burton Benjamin, Highland Park, Ill., and Heinz G. Thomas, Racine, Wis., assignors to Master Appliance Corporation, Racine, Wis.
Filed Jan. 18, 1982, Ser. No. 339,857
Term of patent 14 years
U.S. Cl. D23—77



274,552
PORTABLE FAN AND HEATER
John S. Yuen, Hong Kong, Hong Kong, assignor to John Manufacturing Limited, Hong Kong, Hong Kong
Filed Jan. 8, 1982, Ser. No. 338,098
Claims priority, application United Kingdom, Oct. 9, 1981, 1002920
Term of patent 14 years
U.S. Cl. D23—122



274,553
CUVETTE ROTOR
Matthew J. Perry, Libertyville, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Oct. 3, 1983, Ser. No. 538,250
Term of patent 14 years
U.S. Cl. D24—17

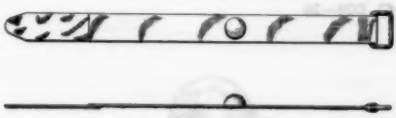


274,554
MEDICAL APPLIANCE FOR PERCUSSIVE RESPIRATORY THERAPY
Peter B. Duffy, 4639½ Tujunga, North Hollywood, Calif. 91602
Filed Dec. 8, 1980, Ser. No. 214,340
Term of patent 14 years
U.S. Cl. D24—36

274,555
BODY MASSAGER
Desmond K. Y. Shiu, Boston, Mass., assignor to Matrix International Industries, Inc., Boston, Mass.
Filed Mar. 11, 1982, Ser. No. 357,125
Term of patent 14 years
U.S. Cl. D24—36

274,556
MASSAGING AND HEATING BELT
Ronald L. Muller, Old Saybrook; Masao Tsuji, Old Lyme, and William J. Rakocy, Madison, all of Conn., assignors to North American Philips Corporation, New York, N.Y.
Filed Dec. 9, 1981, Ser. No. 328,878
Term of patent 14 years
U.S. Cl. D24—40

274,557
WRISTBAND FOR CONTROLLING NAUSEA
Richard Griffith, III, Red Bank, N.J., assignor to AcuBand, Inc., Rumson, N.J.
Filed Mar. 5, 1982, Ser. No. 354,132
Term of patent 14 years
U.S. Cl. D24—99



274,558
SECURITY GUARD ENCLOSURE
William James, Rte. 1, Box 103, England, Ark. 72046
Filed May 3, 1982, Ser. No. 374,639
Term of patent 14 years
U.S. Cl. D25—16

274,559
COVERING REGLET
Wolfgang Rosner, Josephsburgstr. 73a, D-8000 München 80, Fed. Rep. of Germany
Filed Jan. 16, 1981, Ser. No. 225,525
Term of patent 14 years
U.S. Cl. D25—79

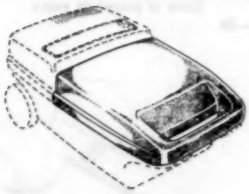
274,560
COMPACT FLUORESCENT LAMP UNIT
Robert G. Young, Nutley; Edward W. Morton, Teaneck; Henry Skwirut, Verona, and Thomas E. Dooley, Clifton, all of N.J., assignors to North American Philips Electric Corp., New York, N.Y.
Division of Ser. No. 206,501, Nov. 13, 1980, Pat. No. Des. 271,474. This application Nov. 14, 1983, Ser. No. 551,649
Term of patent 14 years
U.S. Cl. D26—26

274,561
EMERGENCY STROBE LIGHT OR SIMILAR ARTICLE
Benjamin H. Stansbury, Jr., Beverly Hills, and Alan La Salle, Mar Vista, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Feb. 2, 1982, Ser. No. 345,187
Term of patent 14 years
U.S. Cl. D26—49

274,562
PIPE BOWL SCRAPER
Elton A. Veal, 829 NE. 8th Ave., Ocala, Fla. 32670
Filed Dec. 7, 1983, Ser. No. 558,866
Term of patent 14 years
U.S. Cl. D27—51

274,563
BIRD FEEDER
Morton L. Blasbalg, 26 Sandro Dr., Warwick, R.I. 02886
Filed Aug. 5, 1982, Ser. No. 405,539
Term of patent 14 years
U.S. Cl. D30—15

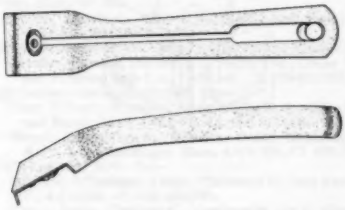
274,564
SUCTION CLEANER COVER OR THE LIKE
Arne J. Diehl, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Sep. 21, 1981, Ser. No. 303,884
Term of patent 14 years
U.S. Cl. D32—31



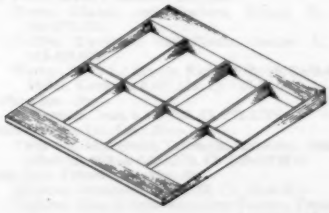
274,565
SQUEEZE MOP
William H. Smith, Jr., Holly Springs, and Robert S. Eldred, South Haven, both of Miss., assignors to Gem, Incorporated, Byhalia, Miss.
Filed May 21, 1982, Ser. No. 380,934
Term of patent 14 years
U.S. Cl. D32—44

274,566
PAINT SCRAPER BLADE HOLDER
Evan J. Osterman, 6920 Foothill Blvd., Tujunga, Calif. 91042
Filed Feb. 1, 1982, Ser. No. 344,475
Term of patent 14 years
U.S. Cl. D32—48

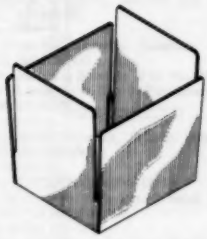
274,567
PAINT SCRAPER
Edward D. Levy, Franklin Lakes, N.J., assignor to Red Devil, Inc., Union, N.J.
Filed May 11, 1982, Ser. No. 377,181
Term of patent 14 years
U.S. Cl. D32—48



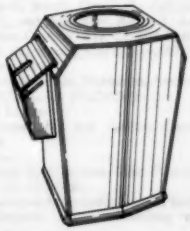
274,568
DISH-DRAIN SUPPORT
Brenda F. Carrothers, Rte. 2, Box 73-A, Bennett, N.C. 27208
Filed Sep. 30, 1982, Ser. No. 429,192
Term of patent 14 years
U.S. Cl. D32—56



274,569
FIXTURE FOR HOLDING BAG
Masao Murooka, 16210 S. Bonsallo, Gardena, Calif. 90247
Filed May 13, 1982, Ser. No. 377,717
Term of patent 14 years
U.S. Cl. D34—6

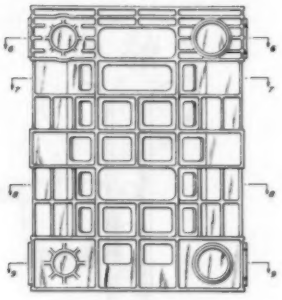


274,570
COVER FOR SERVICE STATION REFUSE CONTAINER WITH REMOVABLE AUXILIARY POCKET
Robert R. Snediker, Winnetka, Ill., assignor to Chicago Show Printing Co., Morton Grove, Ill.
Filed May 10, 1982, Ser. No. 376,374
Term of patent 14 years
U.S. Cl. D34—11

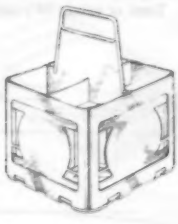


274,571
MOBILE LIFT
Howard H. Vermette, Hammond, Ind., assignor to Vermette Machine Company, Inc., Hammond, Ind.
Filed Jan. 25, 1982, Ser. No. 342,654
Term of patent 14 years
U.S. Cl. D34—34

274,572
WATER BOTTLE CRATE
Daniel R. Miller, Cincinnati, Ohio, assignor to Nestier Corporation, Cincinnati, Ohio
Filed Sep. 21, 1981, Ser. No. 303,607
Term of patent 14 years
U.S. Cl. D34—43



274,573
BOTTLE CARRIER
Thomas E. Torokvei, 15 Barnwood Dr., Don Mills, Ontario, Canada
Filed Mar. 1, 1982, Ser. No. 353,378
Term of patent 14 years
U.S. Cl. D34—44



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TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF JULY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.P.C. Industries, Inc.: *See*—
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Abbe, Robert C.: *See*—
Judell, Neil H.; Abbe, Robert C.; Poduje, Noel S.; and Mallory, Roy, 4,457,664, Cl. 414-779.000.

Abe, Michio; and Maeda, Naoyuki, to Tokai TRW & Co. Ltd. Power steering device. 4,457,390, Cl. 180-142.000.

Abe, Miki, to Sony Corporation. Pulse width modulated signal amplifier. 4,458,208, Cl. 330-10.000.

Abe, Susumu: *See*—
Ohsaki, Takushi; and Abe, Susumu, 4,458,022, Cl. 502-42.000.

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Acda, Petrus M.; and Karreman, Jacob, to Polva-Nederland B.V. Process for the production of coupling pieces from a thermoplastic, and device for carrying out this process. 4,457,886, Cl. 264-249.000.

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Wetmore, Halsey J., 4,457,381, Cl. 172-722.000.

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DesMarais, Raymond C., Jr., 4,457,861, Cl. 252-512.000.

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Adrian, Glenn J.; Adrian, Harry W.; and Penner, James W. Fast recovery electric fluid. 4,458,138, Cl. 219-304.000.

Adrian, Harry W.: *See*—
Adrian, Glenn J.; Adrian, Harry W.; and Penner, James W., 4,458,138, Cl. 219-304.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
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Agfa-Gevaert Aktiengesellschaft: *See*—
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Van de Sande, Christian C.; Vandewalle, Jan J.; Monbaliu, Marcel J.; and Van Poucke, Raphael K., 4,458,011, Cl. 430-543.000.

Ahl, Sven-Erik: *See*—
Pettersson, Karl-Axel G., 4,457,648, Cl. 406-175.000.

Ahlstrom, Lars G. W., to U.S. Philips Corporation. Method for destroying targets and a projectile for carrying out the method. 4,457,475, Cl. 244-3.150.

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Aichelmann, Frederick J., Jr.; and Lange, Lawrence K., to International Business Machines Corporation. Method for storing data words in fault tolerant memory to recover uncorrectable errors. 4,458,349, Cl. 371-13.000.

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Deeba, Michel; and Cochran, Robert N., 4,458,092, Cl. 564-479.000.
Phillips, David J.; and Glazer, Jerome L., 4,458,096, Cl. 585-302.000.
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Teramura, Mitsuyoshi; Takimoto, Masatami; Yasuda, Takeru; and Minoura, Mikio, 4,457,279, Cl. 123-439.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Ishikawa, Masanobu, 4,457,558, Cl. 296-1.00S.
Kodama, Hisashi; Sato, Katsujiro; Tamura, Tetsuomi; Hamamoto, Tooru; and Yamada, Kazuharu, 4,457,270, Cl. 123-90.580.
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Steenken, Gerhard, 4,457,900, Cl. 423-339.000.
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Albrecht, Laurence J.: *See*—
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Almstrom, Sten-Hakan; and Nelving, Hans G., to United Stirling AB. Method of governing the working gas temperature of a solar heated hot gas engine. 4,457,133, Cl. 60-524.000.

Aloziem, Victor I. Decorative pottery. 4,457,103, Cl. 47-66.000.

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Borzym, John J., 4,457,200, Cl. 83-862.000.

Alphonso, Louis J. Apparatus for measuring coil tubing. 4,457,071, Cl. 33-134.00R.

Alter, Richard R., to Continental Plastics Corporation. Shield protector for artificial insemination and culture collection instruments. 4,457,313, Cl. 128-759.000.

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Amaya, Mikio; Kimura, Masatoshi; Kondo, Isao; and Horie, Masakatsu, to Fujitsu Limited. Image recording method. 4,458,258, Cl. 346-153.100.

Ambrogi, Raymond R., to Corning Glass Works. Forming laminated articles from a composite encapsulated charge of molten glass. 4,457,771, Cl. 65-66.000.

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American Cyanamid Company: *See*—
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Cosmos, Pete; and Stephenson, Brian D., 4,457,576, Cl. 339-143.00R.
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Varlet, Hubert; and Catalogna, Aurel, 4,457,438, Cl. 215-252.000.

Bowditch, Philip N., to Charles Stark Draper Laboratory, Inc., The. Automated seam joining apparatus. 4,457,243, Cl. 112-121.140.

Bowen, Alfred J. Integral foundation and floor frame system and method of building construction. 4,457,118, Cl. 52-292.000.

Bowers, Cecil W.: *See*—
Allan, Thomas T.; Bowers, Cecil W.; and Wood, Joseph A., 4,457,336, Cl. 137-601.000.

Bowers, John E.: *See*—
Kino, Gordon S.; Behar, David; Bowers, John E.; and Olaisen, Hermund, 4,458,328, Cl. 364-825.000.

Bowman, Edward E., to Tyler Refrigeration Corporation. Refrigeration system with receiver bypass. 4,457,138, Cl. 62-196.100.

Brabbs, William J.: *See*—
Hong, Charles A.; and Brabbs, William J., 4,457,946, Cl. 426-94.000.

Braid, Milton, to Mobil Oil Corporation. Method for esterification. 4,457,868, Cl. 260-404.000.

Braithwaite, John D.; King, Derrick O.; Williams, Sidney J.; and Prior, James, to Black & Decker Inc.; and Berger, Jensen and Nicholson Limited. Apparatus for applying liquid to a surface having safety vent. 4,457,642, Cl. 401-188.00R.

Brand, Frederick C., to Jack Macmanus Research Limited (Great Britain). Machine for producing whipped cream and other aerated food products. 4,457,876, Cl. 261-28.000.

Brandell, John T., to Halliburton Company. Downhole pump and testing apparatus. 4,457,367, Cl. 166-105.000.

Brandenstein, Manfred: *See*—
Ernst, Horst M.; Brandenstein, Manfred; and Walter, Lothar, 4,457,395, Cl. 180-254.000.
Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, 4,457,740, Cl. 474-112.000.

Brandes, Wilhelm: *See*—
Schmitt, Hans-Georg; Paulus, Wilfried; Genth, Hermann; Brandes, Wilhelm; Reinecke, Paul; and Scheinpflug, Hans, 4,457,930, Cl. 424-248.500.

Braslaw, Jacob: *See*—
Wingfield, Robert C., Jr.; Braslaw, Jacob; and Gealer, Roy L., 4,458,095, Cl. 585-241.000.

Brazie, Paul D.: *See*—
Pusateri, James J.; Bartlett, Charles R.; and Brazie, Paul D., 4,458,127, Cl. 219-10.790.

Brearly Company, The: *See*—
Provi, Mike A., 4,457,385, Cl. 177-211.000.

Brehmer, Kevin E.; and Fisher, John A., to Mostek Corporation. Compensated amplifier having pole zero tracking. 4,458,212, Cl. 330-260.000.

Breisch, John H., to Patterson & Patterson, Inc. Work support unit. 4,457,399, Cl. 182-185.000.

Breville Holdings Pty., Limited: *See*—
McClean, John W., 4,458,139, Cl. 219-433.000.

Brewer, Jacob L.: *See*—
Kirby, Robert E.; and Brewer, Jacob L., 4,457,627, Cl. 366-65.000.

Brey, Larry A.: *See*—
Cadwell, Donald E.; and Brey, Larry A., 4,457,971, Cl. 428-323.000.

Brisard, Gerard J. On-board apparatus for monitoring the condition of shock absorbers. 4,458,234, Cl. 340-52.00R.

Briscoe, Brian H.: *See*—
Brown, William H., 4,457,366, Cl. 166-82.000.

Bristol-Myers Company: *See*—
Gordon, Maxwell; and Pachter, Irwin J., 4,457,933, Cl. 424-260.000.
Juby, Peter F.; Hudyma, Thomas W.; and Colton, Douglas G., 4,457,932, Cl. 424-251.000.
Kamachi, Hajime; Okumura, Jun; and Naito, Takayuki, 4,457,929, Cl. 424-246.000.
Partyka, Richard A.; and Hudyma, Thomas W., 4,458,079, Cl. 548-341.000.

British Aerospace: *See*—
Harris, Jeffery J.; and Greenwood, David I., 4,457,621, Cl. 356-5.000.

British Steel Corporation: *See*—
MacGregor, Ian K.; Scholey, Robert; and Spenceley, Gene D., 4,457,777, Cl. 75-51.000.

Brodrick, Philip H.: *See*—
Hanks, Robert S.; and Brodrick, Philip H., 4,457,445, Cl. 220-214.000.

Broker, Klaus D.; Bruning, Paul; and Wenzel, Eberhard, to Westfalia Separator AG. Centrifuge with a belt-driven spindle. 4,457,745, Cl. 494-15.000.

Brooks, Dannie L., to Reel-O-Matic Systems, Inc. Automatic strip cutting machine. 4,457,195, Cl. 83-69.000.

Brown, Gregory J.; Smith, Meredith E., Jr.; Shah, Hasmukh T.; and Beadles, Cecil D., deceased (by Beadles, Nancy L., executrix), to FMC Corporation. Apparatus for orienting, singulating and sizing mushrooms and like objects. 4,457,434, Cl. 209-539.000.

Brown, Robert L. Storage transfer and production marine platform. 4,457,728, Cl. 441-4.000.

Brown, William H., to Cuthill, Trevor F.; Briscoe, Brian H.; and McLaren, Lloyd W., part interest to each. Wiper device for stripping fluid from well pipe. 4,457,366, Cl. 166-82.000.

Brown & Williamson Tobacco Corporation: *See*—
Lamb, Charles G.; and Porenski, Harry S., 4,457,319, Cl. 131-336.000.

Browne, Frank L.; and Bachle, Walter W., to General Signal Corporation. Cable tray ground clamp. 4,457,577, Cl. 339-14.00L.

Brozovich, John C.; and Brozovich, John P. Power transmission device. 4,457,186, Cl. 74-348.000.

Brozovich, John P.: *See*—
Brozovich, John C.; and Brozovich, John P., 4,457,186, Cl. 74-348.000.

Bruening, Robert A., to Chicago Bridge & Iron Company. Vapor closure for flexures in floating. 4,457,446, Cl. 220-224.000.

Bruning, Paul: *See*—
Broker, Klaus D.; Bruning, Paul; and Wenzel, Eberhard, 4,457,745, Cl. 494-15.000.

Brunvoll, Lars. Needle device for splicing. 4,457,128, Cl. 57-23.000.

Brush, Robert W., Sr.: *See*—
Frazier, Margaret J.; and Brush, Robert W., Sr., 4,457,572, Cl. 339-89.00M.

Brusilow, Saul W. Process for waste nitrogen removal. 4,457,942, Cl. 424-317.000.

Bryant, Richard M.; Clemen, Henry P., Jr.; and Weaver, William H., to Boeing Company, The. Avionic shelf assembly. 4,458,296, Cl. 361-383.000.

Bachel, Karl H.: *See*—
von Bittera, Miklos; Bachel, Karl H.; Plempel, Manfred; and Regel, Erik, 4,457,938, Cl. 424-273.00R.

Bacher, Peter, to Heinrich Bucher, Firma. Method of chilling materials and chilling container. 4,457,142, Cl. 62-388.000.

Buchert, Charles L.: *See*—
Dunette, Don L.; and Buchert, Charles L., 4,457,647, Cl. 405-154.000.

Buchholz, Peter: *See*—
Warnecke, Rolf; and Buchholz, Peter, 4,457,679, Cl. 418-91.000.

Buck, George S., Jr., to Fiberlok, Inc. Method for producing a fiberous batt. 4,457,793, Cl. 156-62.600.

Buckle, Allan S.; and Allso, Philip W., to Lucas Industries plc. Multiphase transistor/diode bridge circuit. 4,458,305, Cl. 363-141.000.

Budde, Richard B., to Ohio Medical Instrument Co., Inc. Surgical retractor. 4,457,300, Cl. 128-20.000.

Burghartz, Hans K.: *See*—
Reinehr, Ulrich; Bernklau, Kurt; Burghartz, Hans K.; Herbertz, Toni; and Jungverdorben, Hermann-Josef, 4,457,885, Cl. 264-177.00F.

Burke, Barry E.; Chiang, Alice M.; and Lindley, William T., to Massachusetts Institute of Technology. Charge domain multiplying device. 4,458,324, Cl. 364-606.000.

Burland, Donald M.: *See*—
Bjorklund, Gary C.; and Burland, Donald M., 4,458,345, Cl. 369-103.000.

Burns Bros., Inc.: *See*—
Coutts, James W., 4,457,131, Cl. 59-35.100.

Burov, Atanas T.: *See*—
Konstantinov, Ivan T.; Mednikarov, Borislav D.; Sahatchieva, Maria A.; and Burov, Atanas T., 4,458,008, Cl. 430-302.000.

Burr-Brown Research Corp.: *See*—
Koen, Myron J., 4,458,201, Cl. 323-317.000.

Burris, Wesley J., II, to Halliburton Company. Sliding valve float collar. 4,457,377, Cl. 166-332.000.

Burroughs Corporation: *See*—
McAnlis, James C.; Kumar, Kuldip; and Gould, Robert T. M., 4,458,307, Cl. 364-200.000.
Ogle, James A., 4,458,134, Cl. 219-121.0LK.
Ragle, Herbert U.; and DeMoss, Dean, 4,458,277, Cl. 360-99.000.
Stopper, Herbert; and Flasck, Richard A., 4,458,297, Cl. 361-403.000.

Burry, Russell D. Waste outlet fittings. 4,457,030, Cl. 4-286.000.

Burson, Bob O.: *See*—
Cooper, Rosemary J.; Ratnam, Devineni V.; and Burson, Bob O., 4,457,425, Cl. 206-38.000.

Busch, Josef: *See*—
Eder, Wilhelm; Hofmann, Hans; Kloeppel, Joachim; Meckl, Heinz; and Busch, Josef, 4,457,495, Cl. 266-170.000.

Buschor, Josef: *See*—
Schmidt, Dieter; Buschor, Josef; and Spillner, Wayne K., 4,457,947, Cl. 426-438.000.

Buttaravoli, Philip M., to E-Med Corporation. Multi-purpose securement strip for use on the body of a patient. 4,457,754, Cl. 604-180.000.

Buvailo, Ilya A.: *See*—
Akhmadiev, Galimzyan M.; Buvailo, Ilya A.; Morgun, Vasily M.; Mutin, Felix I.; and Yastrebov, Petr I., 4,457,236, Cl. 104-138.00G.

Byrne, Stephen C., to Aluminum Company of America. Process for producing elements from a fused bath using a metal strap and ceramic electrode body nonconsumable electrode assembly. 4,457,811, Cl. 204-60.000.

C. R. Bard, Inc.: *See*—
Norton, William J., 4,457,758, Cl. 604-324.000.

Cable Technology Laboratories, Inc.: *See*—
Bahder, George, 4,457,975, Cl. 428-394.000.

Cadars, Patrick, to Valeo. Water box and expansion chamber assembly. 4,457,362, Cl. 165-104.320.

Cadwell, Donald E.; and Brey, Larry A., to Minnesota Mining and Manufacturing Company. Lithographic substrate and its process of manufacture. 4,457,971, Cl. 428-323.000.

Cady, Percy L., to Houdaille Industries, Inc. Punch press assembly including a preloaded encapsulted spring. 4,457,196, Cl. 83-140.000.

Cafiero, Thomas A., to Michigan Hanger Company. Capsule puncturing device. 4,457,427, Cl. 206-229.000.

Caldwell, Kenneth B.; and Beddow, Kenneth W., to Associated Engineering Limited. Automatic speed control systems. 4,457,392, Cl. 180-176.000.

California Institute of Technology: *See*—
Griffith, Joseph E.; Qiu, Yuanxun; and Tombrello, Thomas A., 4,457,972, Cl. 428-334.000.

Calvert, James W.; and Belcher, Samuel, to Cincinnati Milacron Inc. External center pin for blow molding machine. 4,457,688, Cl. 425-525.000.

Camco, Incorporated: *See*—
Knierimen, Jeffrey L.; and Fuller, Mark S., 4,457,368, Cl. 166-217.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See*—
Johnson, Derwyn C.; Kawasaki, Brian S.; and Hill, Kenneth O., 4,457,581, Cl. 350-96.160.

Caniglia, Joseph E. Sponge for containing soap. 4,457,643, Cl. 401-201.000.

Canon Denshi Kabushiki Kaisha: *See*—
Kurihara, Hitoshi; and Wakazawa, Toru, 4,457,230, Cl. 101-110.000.

Canon Kabushiki Kaisha: *See*—
Docking, Paul A. J.; and Glynn, Michael H., 4,457,461, Cl. 224-181.000.
Kurihara, Hitoshi; and Wakazawa, Toru, 4,457,230, Cl. 101-110.000.
Nakata, Shinichi; Takahashi, Hiroshi; Matsuyama, Shigeru; and Hirano, Reiji, 4,458,325, Cl. 364-705.000.
Sado, Ichiro; and Kishimoto, Juji, 4,458,243, Cl. 340-756.000.
Shimizu, Masami, 4,458,230, Cl. 335-271.000.
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,458,256, Cl. 346-140.00R.
Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; Sakai, Shinji; Uchiyama, Takashi; and Momiyama, Kikuo, 4,457,612, Cl. 354-471.000.
Tamura, Katsuhide; and Masaki, Yuichi, 4,457,589, Cl. 350-336.000.
Tamura, Yasuyuki, 4,458,264, Cl. 358-75.000.
Tokuhara, Mitsuhiro, 4,457,616, Cl. 355-8.000.
Tsuboi, Takayuki, 4,457,604, Cl. 354-145.100.
Yokota, Hideo, 4,457,593, Cl. 350-448.000.

Carlson, Alfred D.; Haub, Donald J.; and Snetting, Mark E., to Tennant Company. Debris collecting mechanism. 4,457,036, Cl. 15-49.00R.

Carman, Kenneth K.; and Webb, Stanley G., to Koppers Company, Inc. Gear type coupling with overload protection. 4,457,735, Cl. 464-32.000.

Carminati, Giovanni M.: *See*—
Milani, Carlo; Carminati, Giovanni M.; and Sovera, Attilio, 4,457,931, Cl. 424-250.000.

Carmody, Michael A.; and Cognevicy, Michael L., to Baker Oil Tools, Inc. Flapper type safety valve for subterranean wells. 4,457,376, Cl. 166-332.000.

Carr, Norman L.; Prudich, Michael E.; King, William E., Jr.; and Moon, William G., to Pittsburg & Midway Coal Mining Co., The. Prevention of deleterious deposits in a coal liquefaction system. 4,457,826, Cl. 208-8.0LE.

Carr, Ronald. Self-cleaning magnetic separator for powdered plastic and metal materials and method. 4,457,838, Cl. 209-223.200.

Carrington, James E.; and Westcott, Gerald R., to International Business Machines Corporation. Scan correction for a line printer having multi-pitch type carriers. 4,457,229, Cl. 101-93.140.

Cars & Concepts, Inc.: *See*—
Draper, David L., 4,457,555, Cl. 296-186.000.

Carter, Paul; and Ball, David J., to Automation Industries, Inc. Electrical connector and filter circuit. 4,458,220, Cl. 333-182.000.

Caruthers, Marvin H.; and Matteucci, Mark D., to University Patents, Inc. Process for preparing polynucleotides. 4,458,066, Cl. 536-27.000.

Casimir, Manfred; Kurz, Wolf-Dieter; and Distel, Manfred, to Daimler-Benz Aktiengesellschaft. Motor vehicle fuel tank venting device. 4,457,443, Cl. 220-85.0OS.

Caspari, Richard B.; Whipple, Terry L.; and Thimsen, James A., to Precision Surgical Instruments, Inc. Leg immobilizing apparatus for arthroscopic surgery. 4,457,302, Cl. 128-133.000.

Caspers, John; and Kramer, Rinaldo, to Lummus Crest, Inc. Recovery of hydrogen. 4,457,834, Cl. 208-143.000.

Cassou, Bertrand. Animal enclosure. 4,457,263, Cl. 119-17.000.

Castoe, John H. Testing of oil seals in power-assisted rack and pinion steering units. 4,457,164, Cl. 73-46.000.

Catalogna, Aurel: *See*—
Varlet, Hubert; and Catalogna, Aurel, 4,457,438, Cl. 215-252.000.

Caul, Lawrence D., to Kennecott Corporation. Resin systems for high energy electron curable resin coated webs. 4,457,766, Cl. 51-298.000.

Cebulak, Walter S.: *See*—
Booz, A. David; Barch, Daniel R.; Cebulak, Walter S.; Kapustay, John B., Jr.; and Sartschev, Adam J., 4,457,881, Cl. 264-12.000.

Celamerck GmbH & Co. KG: *See*—
Becher, Heinz-Manfred; Prokic-Immel, Ricarda; and Wirtz, Walter, 4,457,943, Cl. 424-322.000.

Celanese Corporation: *See*—
Chatterjee, Ananda M., 4,458,064, Cl. 528-501.000.
Eickman, Nancy C., 4,458,039, Cl. 523-216.000.
Jaffe, Michael; and Ophir, Zohar, 4,457,962, Cl. 428-36.000.

CEM Corporation: *See*—
Collins, Michael J.; Cruse, Bernard W., Jr.; and Goetchius, Ronald J., 4,457,632, Cl. 374-14.000.

Central Glass Company, Limited: *See*—
Kitsugi, Naomichi; Fujinaga, Teruo; and Otsuka, Toyozo, 4,457,901, Cl. 423-341.000.

Centre National d'Etudes Spatiales: *See*—
Regipa, Robert, 4,457,477, Cl. 244-97.000.

Chabinsky, Irving J., to Raytheon Company. Microwave sheet rubber curing. 4,458,128, Cl. 219-10.55R.

Challenger, Richard, to Taylor-Winfield Corporation, The. Robot welder. 4,458,131, Cl. 219-89.000.

Chancel, Jean-Louis: *See*—
Plantureux, Alain, 4,457,056, Cl. 29-10.000.

Chang, Shih-Jeh, to AT&T Bell Laboratories. Cache memory using a lowest priority replacement circuit. 4,458,310, Cl. 364-200.000.

Chao, Robert L., to Supertex, Inc. CMOS Device with ion-implanted channel-stop region and fabrication method therefor. 4,458,262, Cl. 357-23.110.

Chapman, John L., Jr.; La Valle, Thomas A.; and Nelson, Peter S., to AT&T Technologies, Inc. Electrical protective devices and methods of assembling. 4,458,288, Cl. 361-124.000.

Chapman, John M.; and Antonis, Basil, to THORN EMI plc. Discharge lamps with curved sections and central connections. 4,458,301, Cl. 362-216.000.

Charcire, Jean-Louis; and Dupupet, Guy, to Le Carbone-Lorraine of Tour Manhattan. Brake disc of carbon-carbon composite material. 4,457,967, Cl. 428-212.000.

Charles Stark Draper Laboratory, Inc., The: *See—*
Bowditch, Philip N., 4,457,243, Cl. 112-121.140.
Whitney, Daniel E.; and Seltzer, Donald S., 4,458,321, Cl. 364-513.000.

Charlson, Paul M.; Estry, Richard H.; and Schwieters, Clarence R., to International Business Machines Corporation. Manufacturing method and apparatus for adjusting the position of a magnetic head in a flexible disk drive. 4,458,274, Cl. 360-75.000.

Charvolin, Patrice. Construction kit for electrical circuits. 4,457,721, Cl. 434-224.000.

Chatterjee, Ananda M., to Celanese Corporation. Process and apparatus for continual melt hydrolysis of acetal copolymers. 4,458,064, Cl. 528-501.000.

Chekroun, Isaac; and Heymes, Alain, to Sanofi. Process for the preparation of 2-(thienyl-2)-and 2-(thienyl-3)-ethylamines. 4,458,086, Cl. 549-74.000.

Chemische Werke Huels, A.G.: *See—*
Balzer, Dieter; and Kosswig, Kurt, 4,457,373, Cl. 166-274.000.

Chemplex Company: *See—*
Dombro, Robert A., 4,458,058, Cl. 526-129.000.

Chen, Ming-Tang. Annular rotating roaster. 4,457,219, Cl. 99-449.000.

Chenot, Charles F.; and Walter, Wolfgang, to GTE Products Corporation. Daylight fluorescent lamps employing blend. 4,458,176, Cl. 313-487.000.

Chernikhov, Alexei Y.; Yakovlev, Mikhail N.; Rogov, Nikolai S.; Petrova, Aleftina P.; Martirosov, Eduard B.; and Gul, Valentin E. Heat-resistant composition. 4,458,041, Cl. 523-435.000.

Cherry Electrical Products Corporation: *See—*
Cherry, Walter L., 4,458,293, Cl. 361-288.000.

Cherry, Walter L., to Cherry Electrical Products Corporation. Capacitive keyboard. 4,458,293, Cl. 361-288.000.

Chevron Research Company: *See—*
Farnham, Robert A., 4,457,837, Cl. 208-362.000.
Lee, Bowman; and Santilli, Donald S., 4,458,025, Cl. 502-66.000.
Robinson, Richard C., 4,457,832, Cl. 208-66.000.
Vazin, Gholam R., 4,457,349, Cl. 141-86.000.

Chiang, Alice M.: *See—*
Burke, Barry E.; Chiang, Alice M.; and Lindley, William T., 4,458,324, Cl. 364-606.000.

Chiba, Takehisa: *See—*
Iwao, Junichi; Oya, Masayuki; Baba, Toshio; Iso, Tadashi; and Chiba, Takehisa, 4,457,935, Cl. 424-270.000.

Chicago Bridge & Iron Company: *See—*
Bruening, Robert A., 4,457,446, Cl. 220-224.000.
Engdahl, Gerald E., 4,457,769, Cl. 62-532.000.

Chika, John J. Apparatus to help learning pictorial art. 4,457,717, Cl. 434-88.000.

Chirokas, Edwin A.: *See—*
Kisler, Semyon; Chirokas, Edwin A.; and Foster, Donald A., 4,457,256, Cl. 118-621.000.

Chitose, Takashi; and Ina, Teruo, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing a molded coil. 4,457,792, Cl. 156-56.000.

Cho, Chih M., to Matahari International Corp. Non-contact direction controller. 4,458,226, Cl. 335-205.000.

Choay, Patrick: *See—*
Fournier, Jean-Paul; and Choay, Patrick, 4,457,875, Cl. 260-543.00R.

Choay S.A.: *See—*
Fournier, Jean-Paul; and Choay, Patrick, 4,457,875, Cl. 260-543.00R.

Cholley, Jean-Marie, to Produits Chimiques Ugine Kuhlmann. Process for desizing and bleaching cloth with a hydrogen peroxide-based bath in a single operation. 4,457,760, Cl. 8-111.000.

Chrisope, Gerald L. Portable system for isolating and culturing bacterium and dispensing a gaseous mixture into culture bag at location where bacterium is obtained. 4,458,019, Cl. 435-243.000.

Christensen, Kenneth W.: *See—*
Rowe, Robert L.; and Christensen, Kenneth W., 4,457,560, Cl. 301-37.00P.

Christoffel, Julius M., Jr.; and Reneer, George, to Gayla Industries, Inc. Keel guided acrobatic kite and control apparatus therefor. 4,457,478, Cl. 244-155.00A.

Christopher, Charles A.: *See—*
Doster, Martha S.; Nute, Alton J.; and Christopher, Charles A., 4,457,372, Cl. 166-274.000.

Chu, Henry: *See—*
Horibata, Hiroshi; Sondreal, John W.; and Chu, Henry, 4,457,084, Cl. 36-7.800.

Chugai Denki Kogyo Kabushiki-Kaisha: *See—*
Shibata, Akira, 4,457,787, Cl. 148-13.100.

Chugai Ro Kogyo Co., Ltd.: *See—*
Maeda, Yasunori; and Nakagaki, Hiroshi, 4,457,694, Cl. 431-90.000.

Chujo, Yoshiki; Yaegashi, Takehisa; and Sugiyama, Shinichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling the air-fuel ratio in an internal combustion engine. 4,458,319, Cl. 364-431.060.

Chung, Harold S.; and Dickert, Joseph J., Jr., to Mobil Oil Corporation. Process for extracting bitumen from tar sands. 4,457,827, Cl. 208-11.0LE.

Ciba-Geigy Corporation: *See—*
Hamilton, Alexander; MacLennan, Alexander H.; and Newton, Christopher, 4,457,783, Cl. 106-288.00Q.
Munk, Kurt, 4,458,029, Cl. 502-171.000.
Munk, Kurt, 4,458,051, Cl. 524-779.000.
Peter, Heinrich; and Bickel, Hans, 4,458,069, Cl. 544-16.000.

Ciciora, Walter, to Zenith Radio Corporation. Sync displacement scrambling. 4,458,268, Cl. 358-120.000.

Cincinnati Milacron Inc.: *See—*
Calvert, James W.; and Belcher, Samuel, 4,457,688, Cl. 425-525.000.

Claassen, Peter: *See—*
List, Helmut; Claassen, Peter; and Zeiringer, Rudolf, 4,457,180, Cl. 73-756.000.

Claber S.p.A.: *See—*
Roman, Gianfranco, 4,457,471, Cl. 239-242.000.

Clarion Co., Ltd.: *See—*
Okada, Hitoshi; Takai, Kazuki; and Yamaguchi, Katsumi, 4,458,276, Cl. 360-96.500.

Clark, George H.; and Clark, Mary A. Semi-automated agglutination viewer for serology testing. 4,457,894, Cl. 422-73.000.

Clark, Mary A.: *See—*
Clark, George H.; and Clark, Mary A., 4,457,894, Cl. 422-73.000.

Clarke, David R.: *See—*
Lange, Frederick F.; and Clarke, David R., 4,457,958, Cl. 427-314.000.

Clarke, Edwin B. Seat cushion. 4,457,032, Cl. 5-481.000.

Clarkson, John F.: *See—*
Legge, Michael H.; Clarkson, John F.; and Bachman, William D., 4,457,775, Cl. 75-0.50B.

Classic Cone Works Ltd.: *See—*
Gruber, Steven R.; Green, Dwight C.; and Bautista, Mark A., 4,457,218, Cl. 99-373.000.

Clear Lake Development Group: *See—*
Porter, Garry L., 4,457,907, Cl. 424-7.100.

Clemen, Henry P., Jr.: *See—*
Bryant, Richard M.; Clemen, Henry P., Jr.; and Weaver, William H., 4,458,296, Cl. 361-383.000.

Clements, Silous F.; Motola, Patrick D.; Simpson, Richard O.; and Swift, Shirley F., to International Business Machines Corporation. Text processor having an interactive display terminal which alternately functions as a data processing terminal. 4,458,311, Cl. 364-200.000.

Clements, Silous F.: *See—*
Amezcua, Robert; Clements, Silous F.; Dachowski, Richard P.; and Motola, Patrick D., 4,458,331, Cl. 364-900.000.

Cleveland, William C., Jr.: *See—*
Sobczak, Isidore F.; Cleveland, William C., Jr.; and Pons, Robert L., 4,457,297, Cl. 126-424.000.

Clorox Company, The: *See—*
Sudbury, Barry A.; and Zielske, Alfred G., 4,457,855, Cl. 252-98.000.

Close, Albert, to McCulloch Corporation. Sharpening device for a chain saw. 4,457,069, Cl. 30-138.000.

Coal Industry (Patents) Limited: *See—*
Evans, Edwin L.; Sidebottom, Ronald; Price, David W.; and Bonafont, Roger L., 4,458,043, Cl. 524-66.000.

Coate, William C., to Lodge & Shipley Company, The. Automatic tool changer for a lathe. 4,457,065, Cl. 29-568.000.

Cocco, Andrea: *See—*
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Wiant, Morris N.; and Schmidt, Frank T., 4,457,546, Cl. 293-102.000.

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Gangwisch, William J.; Richter, Virgil J.; Wixon, Harold E.; and Wraga, Joseph B., 4,457,854, Cl. 252-91.000.
Scott, George V., 4,457,908, Cl. 424-49.000.

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Vickrey, Richard A., Jr., 4,457,888, Cl. 376-272.000.
Comerco, Inc.: *See*—
Kelley, Laurence J., 4,457,436, Cl. 211-88.000.
Comfy Catch-A-Spec Company: *See*—
Knowles, Adrienne, 4,457,314, Cl. 128-760.000.
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Mahoney, Trevor W., 4,458,266, Cl. 358-105.000.
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Knight, Peter D., 4,458,122, Cl. 200-153.0LA.
Compton, Brian: *See*—
Knight, Lindsay C.; and Compton, Brian, 4,457,715, Cl. 434-22.000.
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Dusette, Don L.; and Buchert, Charles L., 4,457,647, Cl. 405-154.000.
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Gaiffier, Albert, 4,457,701, Cl. 431-24.000.
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Shepard, John K.; and Wagonseller, Walter R., 4,457,465, Cl. 229-5.600.
Continental Plastics Corporation: *See*—
Alter, Richard R., 4,457,313, Cl. 128-759.000.
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Suter, Hans-Jorg; and Wild, Jurg, 4,458,182, Cl. 318-113.000.
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Cooper, Rosemary J.; Ratnam, Devineni V.; and Burson, Bob O., to Phelon Magnagrip Co., Inc. Magnetic holder for keys and the like and method of manufacturing the same. 4,457,425, Cl. 206-38.000.
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Corcoran, Sean. Method for cutting slits in flexible plastics sheeting. 4,457,199, Cl. 83-862.000.
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Womack, Billy B., 4,458,294, Cl. 361-321.000.
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Corry, William R. Jibe mill. 4,457,669, Cl. 416-119.000.
Cosmos, Pete; and Stephenson, Brian D., to AMP Incorporated. One piece metal shield for an electrical connector. 4,457,576, Cl. 339-143.00R.
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Cottam, John L.: *See*—
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Morley, James P., 4,457,521, Cl. 277-92.000.
Craft, William K.; and Scheele, Wilfrid J., to Batesville Casket Company, Inc. Casket shelf. 4,457,054, Cl. 27-1.000.
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Crawford, William K.; and Kovacik, Ronnie, to Pratt & Whitney Canada Inc. Bearing support structure. 4,457,568, Cl. 308-207.00A.
Croci, Paul: *See*—
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Cruse, Bernard W., Jr.: *See*—
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Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., to Multiform Desiccants, Inc. Self-retaining adsorbent container. 4,457,843, Cl. 210-282.000.
Cummins, Mark A. Foam generating device for wells. 4,457,375, Cl. 166-309.000.
Cumpelik, Boris M.: *See*—
Conner, Donald E.; and Cumpelik, Boris M., 4,457,911, Cl. 424-59.000.
Cumpston, Edward H. Combination lock. 4,457,147, Cl. 70-213.000.
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Cunningham, Kirk M.: *See*—
Goldberg, Marvin C.; and Cunningham, Kirk M., 4,457,624, Cl. 356-336.000.
Curry, John N. Blades for earth moving machines. 4,457,380, Cl. 172-701.300.
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Brown, William H., 4,457,366, Cl. 166-82.000.
Dabill, David W.; Gentry, Stephen J.; Hurst, Nicholas W.; Jones, Alan; and Walsh, Peter T., to National Research Development Corporation. Catalytic gas-sensitive elements. 4,457,954, Cl. 427-125.000.
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Dahowski, Donald E., to Fox Pool Corporation. Swimming pool coping. 4,457,119, Cl. 52-300.000.
Daicel Chemical Industries, Ltd.: *See*—
Kanno, Tatsuya; and Toga, Yuzo, 4,458,063, Cl. 528-418.000.
Kawai, Kimitoshi; Sugawara, Kunio; and Morinaga, Tsuyoshi, 4,457,863, Cl. 260-112.00R.
Daikin Kogyo Company, Ltd.: *See*—
Okamura, Kazuo; Tamura, Kohji; Daimon, Shigeo; and Shibuya, Yoshiyuki, 4,457,955, Cl. 427-127.000.
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Hakuraku, Yoshinori; Ogata, Hisanao; and Daikoku, Takahiro, 4,457,135, Cl. 62-3.000.
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Daimler-Benz Aktiengesellschaft: *See*—
Bernauer, Otto; and Ziegler, Klaus, 4,457,891, Cl. 420-434.000.
Casimir, Manfred; Kurz, Wolf-Dieter; and Distel, Manfred, 4,457,443, Cl. 220-85.00S.
Papenhagen, Dieter; Wallentowitz, Henning; Lepler, Gerhard; and Hampp, Martin, 4,457,189, Cl. 74-513.000.
Renz, Udo D., 4,457,559, Cl. 301-37.00P.
von der Ohe, Manfred; and Flemming, Helmut, 4,457,537, Cl. 280-675.000.
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Okamura, Kazuo; Tamura, Kohji; Daimon, Shigeo; and Shibuya, Yoshiyuki, 4,457,955, Cl. 427-127.000.
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Dainippon Pharmaceutical Co., Ltd.: *See*—
Hayashi, Hiroshi; and Komiya, Masanobu, 4,457,916, Cl. 424-101.000.
Dainippon Screen Mfg., Co., Ltd.: *See*—
Ogami, Nobutoshi; Takada, Takeshi; Shoda, Mikio; and Kurata, Yasuhiro, 4,457,419, Cl. 198-345.000.
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Daniels, John Y.; and Stevenson, James C., to Springs Industries, Inc. Textile fabrics with opaque pigment printing and method of producing same. 4,457,980, Cl. 428-196.000.

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Knabel, Walter; and D'Antonio, Nicholas F., 4,458,157, Cl. 307-119.000.

Dantzig, Jonathan A.; and Tyler, Derek E., to International Telephone and Telegraph Corporation. Mold for use in metal or metal alloy casting systems. 4,457,354, Cl. 164-468.000.

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Darling, Stewart A.; Kostanecki, Tadeusz; and Soos, George, to DRG Inc. Tamper resistant security package. 4,457,430, Cl. 206-459.000.

Darnall, Thomas A., Jr. Record centering and decoupling devices for turntables. 4,458,347, Cl. 369-270.000.

Das, Balbhadra; and Melle, Carl A., to PPG Industries, Inc. Glass fiber reinforced thermoplastics. 4,457,970, Cl. 428-290.000.

DAT Agri-Products, Inc.: *See*—
Wold, Allan N., 4,457,444, Cl. 220-213.000.

Data Electronics, Inc.: *See*—
Mroz, Edward; and Wesendunk, Richard J., 4,457,473, Cl. 242-192.000.

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Maclay, William R.; and Merritt, Lauren V., 4,458,278, Cl. 360-99.000.

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David, Allan P.: *See*—
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Davis, Alan R., to Eaton Corporation. Adjustable spring seat. 4,457,501, Cl. 267-177.000.

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Ambrose, Jere B.; Van Compernolle, Donald D.; and Davis, Alfred L., 4,457,055, Cl. 28-111.000.

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Davis, Wayne S.; and Swengel, Robert C., Jr., to AMP Incorporated. Electrical connector having improved shielding and keying systems. 4,457,575, Cl. 339-143.00R.

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D'Amico, John F.; and DeAngelo, Michael A., Jr., 4,457,951, Cl. 427-96.000.

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Decailliot, Michael D.; and Besson, Raymond J., to Etat Francais represente par le Delegue General pour l'Armement. Microwave warmup device for HF resonator. 4,458,169, Cl. 310-315.000.

DeCoster, Christopher P.: *See*—
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Meiers, Gerald F., 4,457,226, Cl. 100-5.000.

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DeGideo, Thomas L. Self cleaning side view mirror. 4,457,597, Cl. 350-582.000.

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Rocholl, Johan P.; and De Jong, Hendrikus, 4,457,965, Cl. 428-141.000.

De Keijzer, Abraham A., to U.S. Philips Corporation. Color display tube. 4,458,174, Cl. 313-402.000.

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Del Vecchio, Joseph A.; Hunnibell, Kenneth L.; Ladewig, Christopher G.; and Harrison, Mark S., to Lipstep Design Group Corp. Wheelchair lift. 4,457,402, Cl. 187-12.000.

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Krooss, Robert J.; and Demarest, David D., 4,457,421, Cl. 198-396.000.

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DeMoss, Dean: *See*—
Ragle, Herbert U.; and DeMoss, Dean, 4,458,277, Cl. 360-99.000.

Dempsey, Russell M.; Fragala, Anthony R.; LaConti, Anthony B.; and Enos, John F., to General Electric Company. Method and device for evolution of oxygen with ternary electrocatalysts containing valve metals. 4,457,824, Cl. 204-290.00F.

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Denton, David L.: *See*—
Thompson, James M.; and Denton, David L., 4,457,317, Cl. 131-96.000.

Denyer, Robert; and Fortuin, Michael S., to Imperial Chemical Industries PLC. Dental compositions from urethane acrylate, diacrylate monomer, camphorquinone and dimethylaminoethyl methacrylate. 4,457,818, Cl. 204-159.190.

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DesMarais, Raymond C., Jr., to Additive Technology Corporation. Method, materials and apparatus for manufacturing printed circuits. 4,457,861, Cl. 252-512.000.

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Matty, Thomas C.; Whalen, Dennis E.; Schmitz, William E.; and DeTine, Pamela E., 4,458,185, Cl. 318-270.000.

Detroit, William J., to Reed Lignin Inc. Oil well drilling clay conditioners and method of their preparation. 4,457,853, Cl. 252-8.50A.

Deutschmann, Herbert, to MTU Motoren-und Turbinen-Union Friedrichshafen GmbH. Turbocharge system for internal combustion engines. 4,457,134, Cl. 60-612.000.

deVries, Egbert, to Quad Environmental Technologies Corporation. Refrigerated structure. 4,457,214, Cl. 98-1.500.

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Papalos, John G.; Villa, Jose L.; Knitter, Kathy A.; and Savoly, Arpad, 4,457,762, Cl. 44-51.000.
Papalos, John G.; and Savoly, Arpad, 4,457,874, Cl. 260-512.00C.

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Eue, Ludwig; Schmidt, Robert; and Dickore, Karlfried, 4,457,774, Cl. 71-93.000.

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Diem, Hans; Fritsch, Robert; Lehnert, Heinz; Matthias, Guenther; Schatz, Hermann; and Wittmann, Otto, to BASF Aktiengesellschaft. Preparation of cocondensates which produce weather-resistant bonding. 4,458,049, Cl. 524-595.000.

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Dills, Raymond L.; Hunt, Royce W.; and Fitzmayer, Louis H., to General Electric Company. Microwave oven with dual feed excitation system. 4,458,126, Cl. 219-10.55F.

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Disen, Sven R., to K B Weecan Marine. Method of fabricating an integral shell formed body and the body formed thereby. 4,457,249, Cl. 114-88.000.

Distel, Manfred: *See*—
Casimir, Manfred; Kurz, Wolf-Dieter; and Distel, Manfred, 4,457,443, Cl. 220-85.00S.

Dittakavi, Ashok; and Thompson, Barbara J., to Texas Instruments Incorporated. Electronic learning aid for providing sequencing and spelling exercises. 4,457,719, Cl. 434-159.000.

Docking, Paul A. J.; and Glynn, Michael H., to Canon Kabushiki Kaisha. Head mounting apparatus. 4,457,461, Cl. 224-181.000.

Doinaga, Hajime: *See*—
Hosokai, Tetsushi; Doinaga, Hajime; and Shiraishi, Hideo, 4,457,275, Cl. 123-339.000.

Dolazza, Enrico, to Analogic Corporation. Digital x-ray system. 4,458,267, Cl. 358-111.000.

Dollerschell, John O., to MTS Systems Corporation. Control mode switching circuit. 4,458,189, Cl. 318-591.000.

Dombro, Robert A., to Chemplex Company. Polymerization method. 4,458,058, Cl. 526-129.000.

Domogalla, John C., to Texas Instruments Incorporated. Combination of an analog to digital converter with a sampling switch error correction circuit and least significant bit circuit. 4,458,237, Cl. 340-347.0AD.

Donaldson, John M.; Vidosh, Donn E.; Karlson, Lars G.; and Thomas, Dennis A., to Gernnimo Industries, Ltd. Emergency descent device. 4,457,400, Cl. 182-234.000.

Donges, Reinhard; and Horn, Klaus, to Hoechst Aktiengesellschaft. Photopolymerizable mixture and photopolymerizable copying material prepared therewith. 4,458,006, Cl. 430-283.000.

Donnelly, Frank, to Spiniello Construction Company. System for providing temporary water service between a water main and one or more locations normally connected to the main. 4,457,326, Cl. 137-59.000.

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Donohue, John A., to Standard Oil Company (Indiana). Process for electrochemical reduction of terephthalic acid. 4,457,814, Cl. 204-75.000.

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Dorfmueller, David D.: *See*—
Imsand, Bruce E.; Thomas, Chris L.; and Dorfmueller, David D., 4,458,330, Cl. 364-900.000.

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Willis, Barry G.; Schleifer, Arthur; Bell, Norton W.; Dryden, Paul C.; Stefanski, Andrew; and Dorny, C. Nelson, 4,458,323, Cl. 364-582.000.

Doster, Martha S.; Nute, Alton J.; and Christopher, Charles A., to Texaco Inc. Method of recovering petroleum from underground formations. 4,457,372, Cl. 166-274.000.

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Hughes, David W., 4,458,061, Cl. 528-73.000.
McIntyre, James A.; and Phillips, Robert F., 4,457,953, Cl. 427-113.000.
Walles, Wilhelm E., 4,457,977, Cl. 428-463.000.
Warner, Patricia A.; Greminger, George K.; and Gibson, Clark W., 4,458,068, Cl. 536-91.000.

Dow Corning Corporation: *See*—
Porsche, Arthur F., 4,457,887, Cl. 264-300.000.

Dowley Manufacturing, Inc.: *See*—
Eason, Lloyd R., 4,457,061, Cl. 29-264.000.

Drachenberg, Franz; and Oefner, Walter, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Bending spring made of fiber compound material. 4,457,500, Cl. 267-148.000.

Draeger, Eberhard; and Lubbers, Henning, to Hoechst Aktiengesellschaft. Use of hydroxyphenyl-thiazole-, -thiazoline- and -thiazolidine-carboxylic acids, for influencing the collagen metabolism. 4,457,936, Cl. 424-270.000.

Druenert, Klaus, to Merck Patent Gesellschaft mit beschrankter Haftung. Surgical materials suitable for use with bone cements. 4,457,028, Cl. 3-1.910.

Dragan, William B. Dental syringe. 4,457,712, Cl. 433-90.000.

Draper, David L., to Cars & Concepts, Inc. Conversion of vehicle bodies. 4,457,555, Cl. 296-186.000.

Dremmel, Engelbert, to Rost, Kurt. Method for producing coffee and coffee machine for carrying out the method. 4,457,216, Cl. 99-287.000.

Dreves, Adrianus, to North West Engineering B.V. Apparatus for a slaughterhouse, more specially for the removal of the toe-web of pigs. 4,457,048, Cl. 17-1.00R.

DRG Inc.: *See*—
Darling, Stewart A.; Kostanecki, Tadeusz; and Soos, George, 4,457,430, Cl. 206-459.000.

Droste, Gunter: *See*—
Seiler, Klaus D.; Stapel, Wilheim; and Droste, Gunter, 4,457,244, Cl. 112-184.000.

Druckerei Gorius: *See*—
Hoine, Dieter, 4,457,540, Cl. 283-94.000.

Dryden, Paul C.: *See*—
Willis, Barry G.; Schleifer, Arthur; Bell, Norton W.; Dryden, Paul C.; Stefanski, Andrew; and Dorny, C. Nelson, 4,458,323, Cl. 364-582.000.

Ducloux, Marcel L., to Saint-Gobain Emballage. Apparatus for diverting objects from a main conveyor path. 4,457,420, Cl. 198-369.000.

DuCorday, Gerard M. Magnifier reader. 4,457,585, Cl. 350-235.000.

Dudman, Richard L., to EGC Enterprises Incorp. Extreme-temperature sealing device and annular seal therefor. 4,457,491, Cl. 251-317.000.

Dufour, Gerald. Mandibular stabilizer. 4,457,708, Cl. 433-6.000.

Dukess, Joseph. Cap liner having an intermediate layer of discrete strips. 4,457,440, Cl. 215-347.000.

du Manoir de Juaye, Pierre; Guerit, Pierre; Pollet, Gilbert; and Vassiliadis, Marc, to Servimetal. Filtration block for liquid metals and alloys, with a mechanical and physical-chemical effect. 4,457,496, Cl. 266-227.000.

Dumler, Charles L.: *See*—
Galluzzo, Daniel T.; and Dumler, Charles L., 4,457,816, Cl. 204-105.00R.

Duncan, Bernard F.: *See*—
Bergeron, Steven F.; and Duncan, Bernard F., 4,457,820, Cl. 204-192.00E.

Dunegan, Ronald G., to Rodun Development Corporation. Pipe flange protector with elastomeric self-centering rib. 4,457,517, Cl. 277-12.000.

Dunlop Limited: *See*—
Atkin, Howard S., 4,457,736, Cl. 464-85.000.

Dunn, John R., to Polysar Limited. Bonding elastomers. 4,457,799, Cl. 156-307.100.

Du Pont de Nemours, E. I., and Company: *See*—
Berge, Charles T.; and Mack, Mark P., 4,458,027, Cl. 502-104.000.
Hatchadoorian, Edward; Ostapchenko, George J.; Patton, James L.; and Young, Harlan S., 4,457,797, Cl. 156-242.000.
Summers, James T., 4,457,974, Cl. 428-373.000.

Dupupet, Guy: *See*—
Chareire, Jean-Louis; and Dupupet, Guy, 4,457,967, Cl. 428-212.000.

Durkan, Gerald, to Tritec Industries, Inc. Respirating gas supply control method and apparatus therefor. 4,457,303, Cl. 128-204.240.

Durkoppewerke GmbH: *See*—
Seiler, Klaus D.; Stapel, Wilheim; and Droste, Gunter, 4,457,244, Cl. 112-184.000.

Durschlag, Mark S.; and Vorhaus, James L., to Raytheon Company. Lumped passive components and method of manufacture. 4,458,295, Cl. 361-322.000.

Duruisseaud, Pierre: *See*—
Crosnier, Bernard; Duruisseand, Pierre; Fras, Gilles; Jouanna, Paul; and Portales, Jean-Luc, 4,458,245, Cl. 340-853.000.

Dusette, Don L.; and Buchert, Charles L., to Con-Prod, Inc. Re-rounding deflected underground plastic pipe and remedying over belling and faulty grading thereof. 4,457,647, Cl. 405-154.000.

Dustbane Products Limited/Les Produits Dustbane Limitee: *See*—
Hammond, Dennis A., 4,457,038, Cl. 15-145.000.

Duvall, David S.: *See*—
Ruckle, Duane L.; and Duvall, David S., 4,457,948, Cl. 427-34.000.

Dwyer, Arthur S.: *See*—
Kasevich, Raymond S.; Kolker, Myer; and Dwyer, Arthur S., 4,457,365, Cl. 166-60.000.

Dziki, Michael M., to Minnesota Mining and Manufacturing Company. Apparatus for dispensing thermoplastic material. 4,457,457, Cl. 222-146.0HE.

E-Med Corporation: *See*—
Buttaravoli, Philip M., 4,457,754, Cl. 604-180.000.

Eason, Lloyd R., to Dowley Manufacturing, Inc. Harmonic balancer installer. 4,457,061, Cl. 29-264.000.

Easterday, Arthur M., to Safe Play Manufacturing Co., Inc. Boxing glove with thumb tie down. 4,457,023, Cl. 2-18.000.

Eastern Company, The: *See*—
Weinerman, Lee S., 4,457,146, Cl. 70-100.000.

Eastman Kodak Company: *See*—
Thompson, James M.; and Denton, David L., 4,457,317, Cl. 131-96.000.

Eaton Corporation: *See*—
Davis, Alan R., 4,457,501, Cl. 267-177.000.
Forsell, Kenneth A., 4,458,225, Cl. 335-35.000.
Geppert, Steven; and Slicker, James M., 4,458,194, Cl. 318-811.000.
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,458,287, Cl. 361-103.000.
Kenny, Andrew A.; and Peloza, Kirk B., 4,458,116, Cl. 200-61.890.
Kroth, Neil W.; and Nat, Gursharan P. S., 4,458,124, Cl. 200-311.000.
Light, Gerard M., 4,457,417, Cl. 192-58.00B.
Monick, Frederick R.; and Muster, Stanley J., 4,457,407, Cl. 188-71.900.
Zukausky, Keith E., 4,457,343, Cl. 138-45.000.

Ebersole, Jeffrey L., to Forsyth Dental Infirmary for Children. Serological method for the identification of microorganisms. 4,458,014, Cl. 435-7.000.

Eberth, Peter J.: *See*—
Karis, Arthur T.; and Eberth, Peter J., 4,457,657, Cl. 414-45.000.

Ebner, Jerry R., to Monsanto Company. Process for oxidation and ammoxidation. 4,457,905, Cl. 423-376.000.

Echols, John: *See*—
Kaufman, Peter; Sharkey, John J.; and Echols, John, 4,458,173, Cl. 310-338.000.

Eckert, Hermann: *See*—
Mason, Joe; Noble, Gerald; Eckert, Hermann; and Tissing, Steven, 4,457,795, Cl. 156-73.500.

Eder, Wilhelm; Hofmann, Hans; Kloeppel, Joachim; Meckl, Heinz; and Busch, Josef, to Agfa-Gevaert Aktiengesellschaft. Apparatus for the automatic recovery of silver from argentiferous wash waters. 4,457,495, Cl. 266-170.000.

Edwards, Gene R. Charcoal cooker. 4,457,290, Cl. 126-9.00R.

EGC Enterprises Incorp.: *See*—
Dudman, Richard L., 4,457,491, Cl. 251-317.000.

Egloff, David: *See*—
Binder, Rolf; Egloff, David; and Hanselmann, Daniel, 4,457,058, Cl. 29-125.000.

Eguchi, Seiji: *See*—
Suzuki, Seigo; Eguchi, Seiji; and Moriya, Yoshiaki, 4,458,313, Cl. 364-200.000.

Eibe, Werner W., to White Consolidated Industries, Inc. Overhung bar rolling mill stand and two-axis gauge control system. 4,457,155, Cl. 72-241.000.

Eibenschutz, Eugenio. Attachment to transform a mechanical into a shaft lathe. 4,457,192, Cl. 82-2.00R.

Eichler, Volker; and Lein, Werner, deceased (by Lein, Annelies, heir), to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Stack control apparatus for sheet feeders. 4,457,508, Cl. 271-152.000.

Eickman, Nancy C., to Celanese Corporation. Thermotropic liquid crystalline polymer blend with reduced surface abrasion. 4,458,039, Cl. 523-216.000.

Eidschun, Charles D., to Micro-Plate, Inc. Brush seal and method. 4,457,515, Cl. 277-1.000.

Eigelbach, Ray C.: *See—*
Wilson, Arthur C.; and Eigelbach, Ray C., 4,457,545, Cl. 292-29.000.

Eino, Tomomi: *See—*
Muramatsu, Toshihiko; Kobayashi, Akio; Eino, Tomomi; and Kondo, Toshio, 4,457,282, Cl. 123-486.000.

Eisai Co., Ltd.: *See—*
Kataoka, Tsunehiko; Nagara, Yoshiaki; Hashimoto, Akira; Konishi, Masayuki; and Ogawa, Koichi, 4,458,018, Cl. 435-218.000.

Ekber, Boris Y.: *See—*
Timoshenko, Grigory M.; Kravets, Vladimir G.; Timoshenko, Vladimir G.; Zima, Petr F.; Astrakhan, Alexandr Z.; Overko, Valentin M.; Isadchenko, Vasily S.; Lenenko, Stanislav A.; Goldynsky, Gennady G.; Osmanian, Karo A.; Aralov, Evgeny G.; Maleev, Georgy V.; Kuzmich, Igor A.; Ekber, Boris Y.; and Kreschenko, Nikolai A., 4,457,331, Cl. 137-119.000.

Elba-Werk Maschinen-Gesellschaft mbH & Co.: *See—*
Pippinger, Horst, 4,457,660, Cl. 414-332.000.

Eli Lilly and Company: *See—*
Hall, David A., 4,458,071, Cl. 544-90.000.
Huffman, George W., 4,458,085, Cl. 549-51.000.
Kirst, Herbert A., 4,458,065, Cl. 536-16.800.

Elliott Brothers (London) Limited: *See—*
Lewis, Edward L.; Beasley, Robin D.; and Morgon, Trevor A., 4,457,582, Cl. 350-96.200.

Ellis, David G.: *See—*
Schoenberg, Steve A.; Ellis, David G.; and Aronstein, Jesse, 4,457,203, Cl. 84-454.000.

Elmeskog, Alf U. Electrocardiographic electrode device. 4,457,309, Cl. 128-644.000.

Elscint Ltd.: *See—*
Sohval, A. Robert; Cooperstein, Gerald; Fleischer, David; Goldstein, Shyke A.; and Hearn, David R., 4,458,180, Cl. 315-111.810.

EMI Limited: *See—*
Voles, Roger, 4,458,145, Cl. 250-204.000.

Emmett, James R., to Northern Engineering Industries plc. Regeneration of ion exchange materials. 4,457,841, Cl. 209-454.000.

Endo, Akira: *See—*
Fukuda, Minoru; Yamatani, Shigeru; Nishimura, Kotaro; and Endo, Akira, 4,458,348, Cl. 365-185.000.

Endo, Jerry K.; and Connell, Jeffrey P., to Westinghouse Electric Corp. Inflated seal for large annular openings. 4,457,518, Cl. 277-34.300.

Engdahl, Gerald E., to Chicago Bridge & Iron Company. Freeze concentration apparatus and process. 4,457,769, Cl. 62-532.000.

Engel, Hinrich: *See—*
Vogg, Gunter; Engel, Hinrich; and Koch, Eckhard, 4,457,649, Cl. 410-46.000.

Engelhard Corporation: *See—*
Amundsen, Alan R.; and Stern, Eric W., 4,457,926, Cl. 424-245.000.

Engels, Roger: *See—*
Becker, Henry; Hubbard, Rodney; Gibbs, Roger; and Engels, Roger, 4,457,334, Cl. 137-461.000.

Engineering Design and Management Inc.: *See—*
Kriege, Edward A.; Marshall, Paul J.; and Tuckett, Robert B., 4,457,358, Cl. 165-50.000.

Englar, Robert J.; and Huson, Gregory G., to United States of America, Navy. Mono-element combined supercritical high lift airfoil. 4,457,480, Cl. 244-207.000.

Enomoto, Seiji: *See—*
Takemae, Yoshihiro; Nozaki, Shigeki; Mezawa, Tsutomu; Kabashima, Katsuhiko; and Enomoto, Seiji, 4,458,337, Cl. 365-189.000.

Enos, John F.: *See—*
Dempsey, Russell M.; Fragala, Anthony R.; LaConti, Anthony B.; and Enos, John F., 4,457,824, Cl. 204-290.00F.

Enso-Gutzeit Oy: *See—*
Venalainen, Heikki; and Rantanen, Rauno, 4,458,360, Cl. 378-50.000.

Entremont, Jacques; and Levardon, Raymond, to Entremont S.A. Apparatus for continuously separating fat from butter. 4,457,220, Cl. 99-451.000.

Entremont S.A.: *See—*
Entremont, Jacques; and Levardon, Raymond, 4,457,220, Cl. 99-451.000.

Epson Corporation: *See—*
Nagai, Akio, 4,457,639, Cl. 400-322.000.

Erdman, Garard C.; Cottam, John L.; Cox, Leonard S.; and Rosseau, Richard B., to FMC Corporation. Multiple flight elevator system. 4,457,044, Cl. 15-348.000.

Erdman, John L., to Honeywell Inc. Dual firing rate flame sensing system. 4,457,692, Cl. 431-19.000.

Eriksson, Kjell, to Aktiebolaget Bofors. Barrel chamber. 4,457,207, Cl. 89-14.00R.

Ernst, Horst M.; Brandenstein, Manfred; and Walter, Lothar, to SKF Kugellagerfabriken GmbH. Bearing arrangement for the driving wheel of a vehicle. 4,457,395, Cl. 180-254.000.

Eschem Inc.: *See—*
Schure, Ralph M.; and Steele, Gerald H., 4,457,800, Cl. 156-307.300.

Eserhaut, Eldon D.; Gutridge, Donald E.; McNally, Ray F.; and Stumpf, Adolph P., to Singer Company, The. Performance monitor system for aircraft simulator. 4,457,716, Cl. 434-43.000.

Espy, Herbert H., to Hercules Incorporated. Absorbent material. 4,458,042, Cl. 524-14.000.

Esselte Pendaflex Corp.: *See—*
Shepherd, John V.; and Thornley, John S., 4,458,003, Cl. 430-253.000.

Essex-Tec Corporation: *See—*
Kaufman, Peter; Sharkey, John J.; and Echols, John, 4,458,173, Cl. 310-338.000.

Estry, Richard H.: *See—*
Charlson, Paul M.; Estry, Richard H.; and Schwieters, Clarence R., 4,458,274, Cl. 360-75.000.

Etablissemnets Francois Salomon & Fils: *See—*
Salomon, Georges P. J., 4,457,533, Cl. 280-628.000.

Etat Francais represente par le Delegue General pour l'Armement: *See—*
Decailliot, Michael D.; and Besson, Raymond J., 4,458,169, Cl. 310-315.000.

Ethyl Corporation: *See—*
Hornbaker, Edwin D.; and Jones, Jesse D., 4,458,046, Cl. 524-399.000.
Seemuth, Paul D., 4,457,763, Cl. 44-57.000.

Eubank, William R. Solar heating device. 4,457,298, Cl. 126-429.000.

Eue, Ludwig; Schmidt, Robert; and Dickore, Karlfried, to Bayer Aktiengesellschaft. Selectively herbicidal 4-amino-6-tert.-butyl-3-ethylthio-1,2,4-triazin-5(4H)-one. 4,457,774, Cl. 71-93.000.

Evans, Edwin L.; Sidebottom, Ronald; Price, David W.; and Bonafont, Roger L., to Coal Industry (Patents) Limited. Waterproof sheeting. 4,458,043, Cl. 524-66.000.

Evans, Raymond J.: *See—*
Sharp, Bernard C.; and Evans, Raymond J., 4,457,586, Cl. 350-281.000.

Evans, William E.; and Gillett, Jimmie D., to Varo, Inc. Link regulator with feed forward switching control. 4,458,199, Cl. 323-286.000.

Exxon Research & Engineering Co.: *See—*
DiNicolantonio, Arthur R.; and Moustakakis, Bill, 4,457,364, Cl. 165-134.00R.
Seiver, Robert L.; Rebick, Charles; and Goetsch, Duane A., 4,457,836, Cl. 208-254.00H.

Fabcon, Inc.: *See—*
Nash, Richard C.; Hanson, David W.; and Koehn, Richard R., 4,457,682, Cl. 425-219.000.

Fabrig, Paul, to Womako Maschinenkonstruktionen. Method and apparatus for assembling pronged binding strips with stacks of paper sheets or the like. 4,457,655, Cl. 412-7.000.

Facilitated Separations, Ltd.: *See—*
Hill, William E.; and McAuliffe, Charles A., 4,457,898, Cl. 423-219.000.

Fahmy, Mohamed A. H., to FMC Corporation. O-Trihaloethyl phosphorodithioate pesticides. 4,457,923, Cl. 424-224.000.

Faith, Thomas J., Jr.; Irven, Robert S.; and Plante, Sabrina K., to RCA Corporation. Method for mounting a sapphire chip on a metal base and article produced thereby. 4,457,976, Cl. 428-457.000.

Fanuc Ltd.: *See—*
Sakamoto, Keiji; and Seki, Shinji, 4,458,192, Cl. 318-798.000.

Fare, Carlo, to Honeywell Information Systems Italia. Step motor drive circuit. 4,458,191, Cl. 318-696.000.

Farnham, Robert A., to Chevron Research Company. Efficiency addition of ammonia to petroleum fractionation units. 4,457,837, Cl. 208-362.000.

Farr, Glyn P. R., to Lucas Industries Public Limited Company. Anti-skid hydraulic braking systems for vehicles. 4,457,563, Cl. 303-92.000.

Faure, Michel; Lumineau, Yves; and Jouanin, Andre, to Lignes Telegraphiques & Telephoniques. Method and apparatus for the production of optical fibers with lateral gaseous injection. 4,457,770, Cl. 65-3.120.

Favra International s.r.l.: *See—*
Meytsar, Jacques, 4,457,878, Cl. 261-111.000.

Favreau, Michel; and Marguinaud, Andre, to Thomson-CSF. FM Demodulator with variable bandpass filter. 4,458,207, Cl. 329-136.000.

Fay, John A.; Walsh, Cyral M.; and Ko, Venancio, to Norris Industries. Dishwasher with steam generating heater and cold water input. 4,457,323, Cl. 134-18.000.

FeBler, Dieter: *See—*
Roth, Wolfgang; Fichtner, Karl-Heinz; and FeBler, Dieter, 4,457,347, Cl. 140-92.100.

Fekete, Kalman; Karnischer, Tamas; Malovecz, Istvan; Tuba, Istvan; Lukasics, Bela; Makk nee Petranyi, Magdolna; Princz, Zoltan; and Szabo, Antal, to Bor- Mubor- es Cipoipari Kutato Intezet. Environment-protecting method for the liming of raw hides. 4,457,759, Cl. 8-94.160.

Feldhake, Ralph H., to Rayovac Corporation. Sealant for lithium cells. 4,457,991, Cl. 429-174.000.

Fennigkoh, Larry: *See—*
Ornato, Joseph P.; Fennigkoh, Larry; and Jaeger, Colleen S., 4,457,312, Cl. 128-711.000.

Fesman, Gerald, to Stauffer Chemical Company. Flexible polyurethane foams containing glycoluril reaction products for a flame and ember drip retardance. 4,458,036, Cl. 521-107.000.

Feterl, Leon G., to Core Industries, Inc. Apparatus for centrifugal separation. 4,457,746, Cl. 494-47.000.

Fiberlok, Inc.: *See—*
Buck, George S., Jr., 4,457,793, Cl. 156-62.600.

Fichtner, Karl-Heinz: *See—*
Roth, Wolfgang; Fichtner, Karl-Heinz; and FeBler, Dieter, 4,457,347, Cl. 140-92.100.

Fields, Larry D., to Yardney Corporation. Reversible quick exhaust valve. 4,457,330, Cl. 137-102.000.

Fields, Larry D., to Yardney Corporation. Liquid filtration system. 4,458,059, Cl. 210-266.000.

Filipsson, Hans A. V.; and Josefsson, Lars-Goran, to Telefonaktiebolaget L M Ericsson. Radar installation. 4,458,246, Cl. 343-7.600.
Finke, Harry P.; Morgan, John W., II; and Poe, Lee G., to Bloom Engineering Company, Inc. Ladle station seal. 4,457,706, Cl. 432-226.000.
Finkel, Menashe. Kitchen utensil. 4,457,222, Cl. 99-494.000.
Finnila, John S. Lumber planing machine. 4,457,350, Cl. 144-117.00R.
Firstenfeld, Ann H.: *See*—
Stevens, Peter P.; McClure, Thomas R.; and Firstenfeld, Ann H., 4,457,453, Cl. 222-48.000.
Fischer, Louis B.: *See*—
Herman, Samuel R.; and Fischer, Louis B., 4,457,516, Cl. 277-12.000.
Fishburne, Francis B. Press for packing compressible material having an air release sleeve. 4,457,125, Cl. 53-527.000.
Fisher, John A.: *See*—
Brehmer, Kevin E.; and Fisher, John A., 4,458,212, Cl. 330-260.000.
Fisher, Roy. Metal melting furnace. 4,457,494, Cl. 266-140.000.
Fitch, Ralph H., to Outboard Marine Corporation. Automatically-controlled gaseous fuel priming system for internal combustion engines. 4,457,271, Cl. 123-187.50R.
Fitzmayer, Louis H.: *See*—
Dills, Raymond L.; Hunt, Royce W.; and Fitzmayer, Louis H., 4,458,126, Cl. 219-10.55F.
Flagler, Robert: *See*—
Bellotti, Marc; and Flagler, Robert, 4,457,749, Cl. 604-29.000.
Flaig, John D., to Outboard Marine Corporation. Marine propulsion device engine cooling system. 4,457,727, Cl. 440-88.000.
Flanders Filters, Inc.: *See*—
Allan, Thomas T.; Bowers, Cecil W.; and Wood, Joseph A., 4,457,336, Cl. 137-601.000.
Flasck, Richard A.: *See*—
Stopper, Herbert; and Flasck, Richard A., 4,458,297, Cl. 361-403.000.
Fleischer, David: *See*—
Sohval, A. Robert; Cooperstein, Gerald; Fleischer, David; Goldstein, Shyke A.; and Hearn, David R., 4,458,180, Cl. 315-111.810.
Flemming, Helmut: *See*—
von der Ohe, Manfred; and Flemming, Helmut, 4,457,537, Cl. 280-675.000.
Flint, Alan G.; and Jacobs, William G., to Applied Materials, Inc. Wafer loading apparatus. 4,457,661, Cl. 414-404.000.
Fluck, Rene, to Sig Schweizerische Industrie-Gesellschaft. Method for removing individual articles from a stack. 4,457,665, Cl. 414-786.000.
FMC Corporation: *See*—
Brown, Gregory J.; Smith, Meredith E., Jr.; Shah, Hasmukh T.; and Beadles, Cecil D., deceased, 4,457,434, Cl. 209-539.000.
Erdman, Garard C.; Cottam, John L.; Cox, Leonard S.; and Rossesu, Richard B., 4,457,044, Cl. 15-348.000.
Fahmy, Mohamed A. H., 4,457,923, Cl. 424-224.000.
Moller, Thomas A.; and Knight, Houston W., 4,457,338, Cl. 137-615.000.
Robertson, James A., 4,457,845, Cl. 210-651.000.
Scheurich, John L.; and Nelson, Gary J., 4,457,209, Cl. 89-45.000.
Wiederrich, James L., 4,457,165, Cl. 73-116.000.
Ford Aerospace & Communications Corp.: *See*—
Sobczak, Isidore F.; Cleveland, William C., Jr.; and Pons, Robert L., 4,457,297, Cl. 126-424.000.
Ford Motor Company: *See*—
Holubka, Joseph W., 4,458,056, Cl. 525-528.000.
Rumpel, Manfred, 4,457,536, Cl. 280-663.000.
Wingfield, Robert C., Jr.; Braslaw, Jacob; and Gealer, Roy L., 4,458,095, Cl. 585-241.000.
Forgac, John M.: *See*—
Hoekstra, George R.; and Forgac, John M., 4,457,374, Cl. 166-251.000.
Forquer, William F., to Security Shutter Corp. Shutter system. 4,457,106, Cl. 49-158.000.
Forschungs Institut fur Textiltechnologie: *See*—
Boheth, Wolfgang; Heger, Adolf; and Passler, Helmar, 4,457,817, Cl. 204-159.150.
Forsell, Kenneth A., to Eaton Corporation. Circuit breaker with independent magnetic and thermal responsive contact separation means. 4,458,225, Cl. 335-35.000.
Forsyth Dental Infirmary for Children: *See*—
Ebersole, Jeffrey L., 4,458,014, Cl. 435-7.000.
Forterre, Gerard; and Hartemann, Pierre, to Thomson-CSF. Method of fixing a ferrite to a metal piece. 4,457,464, Cl. 228-124.000.
Fortuin, Michael S.: *See*—
Denyer, Robert; and Fortuin, Michael S., 4,457,818, Cl. 204-159.190.
Forward Motion, Inc.: *See*—
Gorr, Eric D., 4,457,267, Cl. 123-52.00M.
Foster, Donald A.: *See*—
Kisler, Semyon; Chirokas, Edwin A.; and Foster, Donald A., 4,457,256, Cl. 118-621.000.
Foster, Gordon T.; and Muklevicz, Joseph A., to Gulf & Western Manufacturing Company. Vacuum packaged inflatable flotation device. 4,457,730, Cl. 441-94.000.
Fottner, Franz, to Veit Bekleidungs-Technik GmbH & co. Switch for suspended track apparatus. 4,457,235, Cl. 104-104.000.
Fournier, Jean-Paul; and Choay, Patrick, to Choay S.A. Substituted 2,4 dialkoxy benzene sulfonyl chlorides. 4,457,875, Cl. 260-543.00R.
Fox, Daniel J.: *See*—
Rubin, Fred K.; Blarcom, David V.; and Fox, Daniel J., 4,457,322, Cl. 134-2.000.
Fox Pool Corporation: *See*—
Dabowski, Donald E., 4,457,119, Cl. 52-300.000.
Foxboro Company, The: *See*—
Marsh, David W., 4,457,181, Cl. 73-861.220.
Fracalossi, Roland N.; and Wajer, Mark T., to Wm. T. Burnett & Co., Inc. Flame retardant, char-forming, flexible polyurethane foams. 4,458,034, Cl. 521-107.000.
Fragala, Anthony R.: *See*—
Dempsey, Russell M.; Fragala, Anthony R.; LaConti, Anthony B.; and Enos, John F., 4,457,824, Cl. 204-290.00F.
Framatome: *See*—
Vienne, Alain, 4,457,889, Cl. 376-282.000.
Frank, Wilhelm, to Wilhelm Frank GmbH. Push bar fitting to be introduced into a longitudinal groove of the frame of a window, door, or the like. 4,457,107, Cl. 49-192.000.
Frankenberg, Henry E., to Psi Limited. Device for protecting works of art. 4,458,241, Cl. 340-571.000.
Frankl & Kirchner GMBH & Co KG Fabrik fur Electromotoren und electrische Apparate: *See*—
Heidt, Alfred, 4,458,332, Cl. 364-900.000.
Franz Plasser Bahnbaumaschinen Industrie Gesellschaft m.b.H.: *See*—
Theurer, Josef; and Pichler, Johann, 4,457,234, Cl. 104-7.00B.
Theurer, Josef; Ganguly, Mihir; Bock, Gernot; and Praschl, Wilhelm, 4,457,237, Cl. 105-61.000.
Fras, Gilles: *See*—
Crosnier, Bernard; Duruisseaud, Pierre; Fras, Gilles; Jouanna, Paul; and Portales, Jean-Luc, 4,458,245, Cl. 340-853.000.
Frass, Werner: *See*—
Mohr, Dieter; Herwig, Walter; Frass, Werner; and Usbeck, Gerhard, 4,458,005, Cl. 430-271.000.
Frazier, Margaret J.; and Brush, Robert W., Sr., to Bendix Corporation, The. Coupling nut for an electrical connector. 4,457,572, Cl. 339-89.00M.
Fredrick, Edmund R.: *See*—
Hales, Harvey E., deceased; and Fredrick, Edmund R., 4,457,468, Cl. 238-8.000.
Frick Company: *See*—
Garland, Milton W., 4,457,681, Cl. 418-201.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Bohlander, Friedhelm; and Rywalski, Heinrich, 4,457,449, Cl. 220-445.000.
Friedmann, Oswald: *See*—
Maucher, Paul; Friedmann, Oswald; and Sonntag, Siegfried, 4,458,156, Cl. 290-38.00B.
Frigid Units, Inc.: *See*—
McCloughan, Dexter C., 4,457,441, Cl. 220-5.00A.
Fritsch, Robert: *See*—
Diem, Hans; Fritsch, Robert; Lehnert, Heinz; Matthias, Guenther; Schatz, Hermann; and Wittmann, Otto, 4,458,049, Cl. 524-595.000.
Frommeld, Hans-Dieter: *See*—
Thoese, Klaus; Frommeld, Hans-Dieter; and Scheler, Siegfried, 4,457,997, Cl. 430-160.000.
Frommer, Elmar: *See*—
Grosskinsky, Otto-Alfred; Frommer, Elmar; Rapp, Guenther; and Thomas, Erwin, 4,457,906, Cl. 423-387.000.
Fruehauf Corporation: *See*—
Gielow, Robert L.; and Paul, James C., 4,457,550, Cl. 296-1.00S.
Fry, Scott M.; Hempy, Harry O.; Kirkpatrick, Charles R.; and Kittinger, Bruce E., to International Business Machines Corporation. Queuing commands in a peripheral data storage system. 4,458,316, Cl. 364-200.000.
Frye, John G., Jr.: *See*—
Hardman, Harley F.; Frye, John G., Jr.; and Mazanec, Terry J., 4,458,088, Cl. 560-96.000.
Fuisz, Georg; and Szabo, Lyubomir. Method for dispatching air passengers, airport installation suitable and vehicle suitable therefor. 4,457,554, Cl. 296-179.000.
Fuji Foods Engineering Co., Ltd.: *See*—
Kino, Mitsutaro, 4,457,224, Cl. 99-516.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Miyamoto, Yasuhiko, 4,457,724, Cl. 440-38.000.
Fuji Photo Film Co., Ltd.: *See*—
Ikenoue, Shinpei; Ishii, Kazuo; and Kashiwabara, Akira, 4,457,995, Cl. 430-115.000.
Sekine, Jiro; Komatsuzaki, Hiroshi; Hara, Hiroshi; and Kameyama, Nobuyuki, 4,457,607, Cl. 354-203.000.
Yamamuro, Kiyohiko; Hirano, Shigeo; and Iwasa, Yasuo, 4,458,010, Cl. 430-393.000.
Fuji Xerox Co., Ltd.: *See*—
Kikuchi, Yohsiki; and Ohmori, Takashi, 4,458,252, Cl. 346-74.400.
Takahashi, Toshikatsu; and Yayama, Kazuo, 4,457,619, Cl. 355-60.000.
Fujii, Masahiko: *See*—
Katayama, Hiroomi; Fujii, Masahiko; and Hirosawa, Yoshiaki, 4,457,286, Cl. 123-612.000.
Fujinaga, Teruo: *See*—
Kitsugi, Naomichi; Fujinaga, Teruo; and Otsuka, Toyozo, 4,457,901, Cl. 423-341.000.
Fujisawa Pharmaceutical Company, Ltd.: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,458,078, Cl. 548-227.000.

Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,457,928, Cl. 424-246.000.
Fujita, Tsuyoshi; Komatsu, Shinichi; and Toda, Gyozo, to Hitachi, Ltd. Process for producing wiring circuit board. 4,457,950, Cl. 427-43.100.
Fujitsu Fanuc Limited: *See*—
Inaba, Hajimu; Miyashita, Hideo; and Otsuka, Shoichi, 4,458,188, Cl. 318-568.000.
Kinoshita, Mitsuo, 4,458,326, Cl. 364-723.000.
Miyashita, Hideo, 4,458,290, Cl. 361-152.000.
Fujitsu Limited: *See*—
Amaya, Mikio; Kimura, Masatoshi; Kondo, Isao; and Horie, Masakatsu, 4,458,258, Cl. 346-153.100.
Takemae, Yoshihiro, 4,458,336, Cl. 365-149.000.
Takemae, Yoshihiro; Nozaki, Shigeki; Mezawa, Tsutomu; Kabashima, Katsuhiko; and Enomoto, Seiji, 4,458,337, Cl. 365-189.000.
Yamaguchi, Hisashi; Yoshikawa, Kazuo; and Kurahashi, Keizo, 4,458,244, Cl. 340-768.000.
Yanagisawa, Mamoru; Akasaki, Hidehiko; and Aoki, Hideji, 4,458,291, Cl. 361-212.000.
Zasio, John J.; and Samuels, Michael W., 4,458,129, Cl. 219-68.000.
Fujiwara, Michiaki: *See*—
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; Noda, Koshi; and Morihashi, Toshifumi, 4,457,130, Cl. 57-328.000.
Fujiwara, Shigeru: *See*—
Wada, Hiroto; and Fujiwara, Shigeru, 4,458,161, Cl. 307-400.000.
Fukuda, Minoru; Yamatani, Shigeru; Nishimura, Kotaro; and Endo, Akira, to Hitachi, Ltd. Electrically programmable read only memory having reduced leakage current. 4,458,348, Cl. 365-185.000.
Fukuda, Mutsumi: *See*—
Honda, Seiichirou; Ogawara, Hiroshi; and Fukuda, Mutsumi, 4,457,782, Cl. 106-266.000.
Fukui, Akira: *See*—
Osada, Mitsuo; Kuroishi, Nobuhito; Amano, Yoshinari; and Fukui, Akira, 4,457,780, Cl. 75-236.000.
Fukushima, Naoto; Iwata, Kazuroh; and Hidaka, Kunihiko, to Nissan Motor Company, Limited. Vortex shock absorber with absorbing force relief means. 4,457,409, Cl. 188-282.000.
Fuller, Mark S.: *See*—
Knierimen, Jeffrey L.; and Fuller, Mark S., 4,457,368, Cl. 166-217.000.
Fumio, Mori; Yoshiaki, Omura; Takashi, Nishida; and Kazuo, Itoi, to Kuraray Co., Ltd. Method of producing cyclopropanecarboxylic acids and esters. 4,458,090, Cl. 560-124.000.
Funahashi, Takumi: *See*—
Yanabu, Satoru; Tamagawa, Tohoru; Kaneko, Eiji; and Funahashi, Takumi, 4,458,121, Cl. 200-148.00R.
Furukawa Electric Co., Ltd., The: *See*—
Irie, Shin-ichi; Yamashita, Yasuhiro; Nakano, Takao; and Tanabe, Teruyoshi, 4,458,103, Cl. 174-73.00R.
Furukawa, Junichi: *See*—
Hamai, Kyugo; Nakagawa, Yasuhiko; Nakai, Meroji; Furukawa, Junichi; and Ishizuka, Takashi, 4,457,285, Cl. 123-598.000.
Furuya, Katsuke: *See*—
Watanabe, Kenkichi; Furuya, Katsuke; and Kimoto, Toyoki, 4,457,321, Cl. 133-8.00A.
Futagi, Masaaki: *See*—
Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, 4,457,410, Cl. 192-0.052.
Fuwa, Yoshio: *See*—
Donomoto, Tadashi; Koyama, Mototsugu; Miyake, Joji; and Fuwa, Yoshio, 4,457,979, Cl. 428-614.000.
G. Siempelkamp GmbH & Co.: *See*—
Gerhardt, Klaus; and Goertz, Dieter, 4,457,683, Cl. 425-373.000.
Gagne, Laureat. Collapsible support for garbage bags. 4,457,483, Cl. 248-97.000.
Gaiffier, Albert, to Constructions Electriques R.V. Control circuit for a semi-conductor power element and application to a burner safety device. 4,457,701, Cl. 431-24.000.
Galloway, James H.; and Amato, Carmelo J., to Hooker Chemicals & Plastics Corporation. High amplitude, pulsed current plating system. 4,458,306, Cl. 363-27.000.
Galluzzo, Daniel T.; and Dumler, Charles L., to Hydor Corporation. Electrolysis method for decomposing water into hydrogen gas and oxygen gas. 4,457,816, Cl. 204-105.00R.
Gambell, James W.; and Auvil, Steven R., to Monsanto Company. Hydrogen cyanide process. 4,457,904, Cl. 423-376.000.
Ganguly, Mihir: *See*—
Theurer, Josef; Ganguly, Mihir; Bock, Gernot; and Praschl, Wilhelm, 4,457,237, Cl. 105-61.000.
Gangwisch, William J.; Richter, Virgil J.; Wixon, Harold E.; and Wraga, Joseph B., to Colgate Palmolive Company. High bulk density carbonate-zeolite built heavy duty nonionic laundry detergent. 4,457,854, Cl. 252-91.000.
GAO Gesellschaft fur Automation and Organisation mbH: *See*—
Hoppe, Joachim; and Haghiri-Tehrani, Yahya, 4,457,798, Cl. 156-248.000.
Garland, Milton W., to Frick Company. Volume ratio control means for axial flow helical screw type compressor. 4,457,681, Cl. 418-201.000.
Garska, Daniel C.; and Ritscher, James S., to Union Carbide Corporation. Conversion of certain hydrocarbons using divalent-copper-containing ZSM-5 type catalyst. 4,458,097, Cl. 585-415.000.
Gayla Industries, Inc.: *See*—
Christoffel, Julius M., Jr.; and Reneer, George, 4,457,478, Cl. 244-155.00A.
Gaynor, John C.: *See*—
Palmer, Jay W.; and Gaynor, John C., 4,457,781, Cl. 106-109.000.
Gealer, Roy L.: *See*—
Wingfield, Robert C., Jr.; Braslaw, Jacob; and Gealer, Roy L., 4,458,095, Cl. 585-241.000.
Gebauer, Heinz, to Transamerica DeLaval, Inc. Liquid-level indicator. 4,457,171, Cl. 73-305.000.
Geberth, John D., Jr. Extendable spray gun. 4,457,472, Cl. 239-532.000.
Gebhart, John R.; and Ledoux, Francis X., to United Technologies Corporation. 360° View camera. 4,457,603, Cl. 354-80.000.
Geiger, Rolf: *See*—
Karges, Hermann E.; Heber, Helmut; Uhmann, Rainer; Teetz, Volker; and Geiger, Rolf, 4,457,866, Cl. 260-112.50R.
Geissler, Ulrich; Sprengel, Heide; Herwig, Walter; and Hasenjaeger, Manfred, to Hoechst Aktiengesellschaft. Radiation polymerizable mixture containing reaction products of glycerol acrylates and polyisocyanates. 4,458,007, Cl. 430-284.000.
Geller, William L., to GTE Laboratories Incorporated. Reference voltage source. 4,458,200, Cl. 323-316.000.
Gendler, Jeffrey L., to HRI, Inc. Two-stage catalytic hydroconversion of hydrocarbon feedstocks using resid recycle. 4,457,831, Cl. 208-59.000.
General Electric Company: *See*—
Battista, Richard A.; Bennett, James G., Jr.; and Kokoszka, John J., 4,458,031, Cl. 502-324.000.
Dempsey, Russell M.; Fragala, Anthony R.; LaConti, Anthony B.; and Enos, John F., 4,457,824, Cl. 204-290.00F.
Dills, Raymond L.; Hunt, Royce W.; and Fitzmayer, Louis H., 4,458,126, Cl. 219-10.55F.
Hunter, James W.; and Lavallee, Francois A., 4,458,177, Cl. 313-511.000.
Johnson, Ronald L., 4,458,117, Cl. 200-83.00P.
LaConti, Anthony B.; Dempsey, Russell M.; and Coker, Thomas G., 4,457,823, Cl. 204-282.000.
Lane, L. Jubin, 4,458,164, Cl. 307-519.000.
Tehon, Stephen W.; and Monsay, Evelyn H., 4,458,343, Cl. 367-149.000.
Tomson, James M.; and Bohde, Richard C., 4,457,670, Cl. 417-53.000.
Wilson, Arthur C.; and Eigelbach, Ray C., 4,457,545, Cl. 292-29.000.
General Hospital Corporation, The: *See*—
Holick, Michael F.; and Holick, Sally A., 4,457,918, Cl. 424-180.000.
General Motors Corporation: *See*—
Beardmore, John M., 4,457,269, Cl. 123-90.310.
Rowe, Robert L.; and Christensen, Kenneth W., 4,457,560, Cl. 301-37.00P.
General Signal Corporation: *See*—
Browne, Frank L.; and Bachle, Walter W., 4,457,577, Cl. 339-14.00L.
Taylor, Robert M.; and Wiley, William C., 4,457,808, Cl. 204-1.00T.
Genereux, Ronald P.: *See*—
Berkovitz, Robert A.; and Genereux, Ronald P., 4,458,362, Cl. 381-103.000.
Genth, Hermann: *See*—
Schmitt, Hans-Georg; Paulus, Wilfried; Genth, Hermann; Brandes, Wilhelm; Reinecke, Paul; and Scheinpflug, Hans, 4,457,930, Cl. 424-248.500.
Gentry, Stephen J.: *See*—
Dabill, David W.; Gentry, Stephen J.; Hurst, Nicholas W.; Jones, Alan; and Walsh, Peter T., 4,457,954, Cl. 427-125.000.
George, John M.: *See*—
Cox, Ronald I.; Hoskinson, Ronald M.; Scaramuzzi, Rex J.; Wilson, Patricia A.; and George, John M., 4,457,914, Cl. 424-88.000.
Geosource Inc.: *See*—
Coogler, John M., 4,458,344, Cl. 367-183.000.
Geppert, Steven; and Slicker, James M., to Eaton Corporation. Method and apparatus for pulse width modulation control of an AC induction motor. 4,458,194, Cl. 318-811.000.
Gerber, Heinz J., to Gerber Scientific Instrument Company, The. Low inertia plotter. 4,458,254, Cl. 346-134.000.
Gerber Scientific Instrument Company, The: *See*—
Gerber, Heinz J., 4,458,254, Cl. 346-134.000.
Geren, David K. Sterilization apparatus. 4,457,221, Cl. 99-451.000.
Gerhardt, Klaus; and Goertz, Dieter, to G. Siempelkamp GmbH & Co. Belt-type press. 4,457,683, Cl. 425-373.000.
Germnimo Industries, Ltd.: *See*—
Donaldson, John M.; Vidosh, Donn E.; Karlson, Lars G.; and Thomas, Dennis A., 4,457,400, Cl. 182-234.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Unger, Eberhart; Heitkamp, Herbert; Hessel, Heinz; Plester, Karl-Heinz; and Lagodka, Manfred, 4,457,212, Cl. 92-18.000.
Gibbs, Roger: *See*—
Becker, Henry; Hubbard, Rodney; Gibbs, Roger; and Engels, Roger, 4,457,334, Cl. 137-461.000.
Gibson, Clark W.: *See*—
Warner, Patricia A.; Greminger, George K.; and Gibson, Clark W., 4,458,068, Cl. 536-91.000.
Giebel, Burkhard; Moormann, Hans; and Schrader, Lothar, to Siemens Aktiengesellschaft. Circuit for checking memory cells of programmable MOS-integrated semiconductor memories. 4,458,338, Cl. 365-201.000.
Gielow, Robert L.; and Paul, James C., to Fruehauf Corporation. Means for reducing vehicle drag. 4,457,550, Cl. 296-1.00S.

Giez, Edmund: *See*—
Dornheim, Gotmar; and Giez, Edmund, 4,457,959, Cl. 427-379.000.
Gilbert & Barker Manufacturing Co., Inc.: *See*—
Taylor, James J.; and DiCinque, John, 4,457,401, Cl. 187-8.490.
Giles, Robert R., to Hewlett-Packard Company. Apparatus for capping an ink jet print head. 4,458,255, Cl. 346-140.00R.
Gill, Robert C.; and Naufflett, George W., to United States of America, Navy. New plasticizer for nitropolymers. 4,457,791, Cl. 149-19.300.
Gillett, Jimmie D.: *See*—
Evans, William E.; and Gillett, Jimmie D., 4,458,199, Cl. 323-286.000.
Gilmore, Samuel E. Subsea fluid conduit connections for remote controlled valves. 4,457,489, Cl. 251-148.000.
Gilson Brothers Company: *See*—
Bacon, Roger J., 4,457,086, Cl. 37-257.000.
Giner-Sorolla, Alfredo: *See*—
Simon, Lionel N.; Giner-Sorolla, Alfredo; and Guttag, Alvin, 4,457,919, Cl. 424-180.000.
Gioia, Norman F.; and Seher, Fred H., to Zenith Radio Corporation. Method for providing coextensive raster patterns in television CRT in-line electron guns. 4,457,733, Cl. 445-36.000.
Gipson, Robert M.: *See*—
McCoy, David R.; McEntire, Edward E.; and Gipson, Robert M., 4,457,371, Cl. 166-267.000.
Gitlis, Meir, to Nachshol Electronics Ltd. Apparatus for determining the authenticity of currency. 4,458,143, Cl. 235-449.000.
Givaudan Corporation: *See*—
Baudin, Josiane; and Gonzenbach, Hans U., 4,457,862, Cl. 252-522.00R.
Gladstone, Maryl E. Head garment for protection of clothing. 4,457,027, Cl. 2-174.000.
Glan, Casimer J. Flexible gage clamp apparatus for supporting a flexible gage line. 4,457,080, Cl. 33-404.000.
Glazer, Jerome L.: *See*—
Phillips, David J.; and Glazer, Jerome L., 4,458,096, Cl. 585-302.000.
Glenn, William K., III: *See*—
Jones, John E.; and Glenn, William K., III, 4,457,042, Cl. 15-322.000.
Glynn, Michael H.: *See*—
Docking, Paul A. J.; and Glynn, Michael H., 4,457,461, Cl. 224-181.000.
Goebel, Vaughn S. Method and apparatus for seismic exploration. 4,458,341, Cl. 367-43.000.
Goertz, Dieter: *See*—
Gerhardt, Klaus; and Goertz, Dieter, 4,457,683, Cl. 425-373.000.
Goetchius, Ronald J.: *See*—
Collins, Michael J.; Cruse, Bernard W., Jr.; and Goetchius, Ronald J., 4,457,632, Cl. 374-14.000.
Goetsch, Duane A.: *See*—
Seiver, Robert L.; Rebick, Charles; and Goetsch, Duane A., 4,457,836, Cl. 208-254.00H.
Goff, Willie, Jr.; and Ku, Ta C., to International Business Machines Corporation. Thermal print apparatus using a thermal transfer ribbon such as a multi-colored one, and a printing method. 4,458,253, Cl. 346-76.0PH.
Goldberg, Marvin C.; and Cunningham, Kirk M., to United States of America, Interior. Suspended sediment sensor. 4,457,624, Cl. 356-336.000.
Golden, Michael D., to Western Design Corporation. Drum-type ammunition magazine. 4,457,208, Cl. 89-33.020.
Golder, Peter, to Hofler, Willy. Method and apparatus for synchronizing the sensor movement of a pitch and/or concentricity measuring device for gears. 4,457,074, Cl. 33-179.50R.
Goldstein, Shyke A.: *See*—
Sohval, A. Robert; Cooperstein, Gerald; Fleischer, David; Goldstein, Shyke A.; and Hearn, David R., 4,458,180, Cl. 315-111.810.
Goldymsky, Gennady G.: *See*—
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Golke, Heinz; Volker, Wolfgang; and Donnerhack, Andreas, to Messer Griesheim GmbH. Plastically deformable cooling agent. 4,457,308, Cl. 128-399.000.
Gonzenbach, Hans U.: *See*—
Baudin, Josiane; and Gonzenbach, Hans U., 4,457,862, Cl. 252-522.00R.
Goodger, Brian V.; Mahoney, David F.; and Wright, Ian G. Babesiosis vaccine prepared from soluble parasitic antigen factors isolated from disintegration of Babesia infected erythrocites. 4,457,915, Cl. 424-88.000.
Gordon, Maxwell; and Pachter, Irwin J., to Bristol-Myers Company. Prevention of analgesic abuse. 4,457,933, Cl. 424-260.000.
Gorr, Eric D., to Forward Motion, Inc. Kinetic energy injector—method and apparatus for improving the performance and efficiency of a two-cycle internal combustion engine. 4,457,267, Cl. 123-52.00M.
Gote, Tallback, to ASEA Aktiebolag. Channel-type induction furnace. 4,458,353, Cl. 373-161.000.
Goto, Hiroki: *See*—
Nakashima, Hiroyuki; Sumida, Morihiro; and Goto, Hiroki, 4,457,778, Cl. 75-51.000.
Goto, Jiro: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,457,928, Cl. 424-246.000.
Goto, Tokuju: *See*—
Sando, Yoshikazu; Ishidoshiro, Hiroshi; Minakata, Matsuo; and Goto, Tokuju, 4,457,145, Cl. 68-5.00E.
Goto, Toshiki: *See*—
Asano, Hiroshi; Shimamune, Takayuki; and Goto, Toshiki, 4,457,822, Cl. 204-252.000.
Gottlob, Clifford E., to Gottlob Engine Conversions, Inc. Oil pan assembly. 4,457,274, Cl. 123-195.00C.
Gottlob Engine Conversions, Inc.: *See*—
Gottlob, Clifford E., 4,457,274, Cl. 123-195.00C.
Gould, Robert T. M.: *See*—
McAnlis, James C.; Kumar, Kuldip; and Gould, Robert T. M., 4,458,307, Cl. 364-200.000.
Gowringa Ltd.: *See*—
Hems, Colin E.; and Copsey, Ian S., 4,457,663, Cl. 414-522.000.
Goyal, Ramesh C.; and Turnbull, Thomas H., to John Fluke Mfg. Co., Inc. Method and apparatus for high speed resistance, inductance and capacitance measurement. 4,458,196, Cl. 324-57.00R.
Grace, Oscar M.: *See*—
Ramlow, Gerhard G.; Heyman, Duane A.; and Grace, Oscar M., 4,458,038, Cl. 521-137.000.
Grachtrup, Heinz, to Krupp Polysius AG. Device for sealing the gap between a rotary kiln and an inlet housing. 4,457,520, Cl. 277-85.000.
Gradl, Reinhard: *See*—
Schimmel, Gunther; Gradl, Reinhard; and Heymer, Gero, 4,457,848, Cl. 210-724.000.
Gram, Martin M., to MTS Systems Corporation. Hydraulic press. 4,457,684, Cl. 425-451.900.
Grammas, James J.: *See*—
Ahmann, Joseph; and Grammas, James J., 4,457,466, Cl. 228-57.000.
Grearson, Kenneth R.; and Watson, Robert, Jr., to Multuloc Corporation. Building deck structure. 4,457,115, Cl. 52-73.000.
Green, Charles J., to GT Development Corporation. Safety and venting cap for vehicle fuel tanks. 4,457,325, Cl. 137-39.000.
Green, Dwight C.: *See*—
Gruber, Steven R.; Green, Dwight C.; and Bautista, Mark A., 4,457,218, Cl. 99-373.000.
Greenhouse, Robert: *See*—
Muchowski, Joseph M.; and Greenhouse, Robert, 4,458,081, Cl. 548-453.000.
Greenleaf, Allen H.; and Watson, John T., to Itek Corporation. Self calibrating contour measuring system using fringe counting interferometers. 4,457,625, Cl. 356-360.000.
Greenwood, David I.: *See*—
Harris, Jeffery J.; and Greenwood, David I., 4,457,621, Cl. 356-5.000.
Greminger, George K.: *See*—
Warner, Patricia A.; Greminger, George K.; and Gibson, Clark W., 4,458,068, Cl. 536-91.000.
Griffith, Joseph E.; Qiu, Yuanxun; and Tombrello, Thomas A., to California Institute of Technology. Enhanced adhesion by high energy bombardment. 4,457,972, Cl. 428-334.000.
Griffiths, William A.: *See*—
Bates, Kenneth W.; Griffiths, William A.; and Watts, Norman H., 4,457,459, Cl. 222-599.000.
Grimes, Gary J., to Bell Telephone Laboratories, Incorporated. Circuitry for allocating access to a demand shared bus. 4,458,314, Cl. 364-200.000.
Grimsby, Frank N., to Shell Oil Company. Oilseed extraction process. 4,457,869, Cl. 260-412.400.
Grivas, John C.; and Park, Myong-Gi A., to Sherwin-Williams Company, The. Process for vinyl aromatic monomer polymerization inhibition. 4,457,806, Cl. 203-9.000.
Gross, Thomas D.; and Jagger, Brian E., to Xerox Corporation. Anti-backlash double universal flexible coupling. 4,457,738, Cl. 464-115.000.
Grosskinsky, Otto-Alfred; Frommer, Elmar; Rapp, Guenther; and Thomas, Erwin, to BASF Aktiengesellschaft. Preparation of hydroxylammonium salts. 4,457,906, Cl. 423-387.000.
Grotyohann, Richard G.; Johnston, Byron E.; and Schlinger, Robin, to Mobil Oil Corporation. Process for removal of residual organic matter from purified phosphoric acid. 4,457,899, Cl. 423-321.00S.
Gruber, Robert J.; Bolte, Steven B.; Grushkin, Bernard; and Koch, Ronald J., to Xerox Corporation. Composition with uncrosslinked polymer contained in a crosslinked polymer network. 4,457,998, Cl. 430-98.000.
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GTE Laboratories Incorporated: *See*—
Cogan, Adrian I., 4,458,259, Cl. 357-22.000.
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Bouchard, Andre C.; Hall, Harold H., Jr.; and Loughridge, Frederick A., 4,457,700, Cl. 431-362.000.
Chenot, Charles F.; and Walter, Wolfgang, 4,458,176, Cl. 313-487.000.
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Foster, Gordon T.; and Muklevicz, Joseph A., 4,457,730, Cl. 441-94.000.
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Hall, James B., to Texas Instruments Incorporated. Redundancy map storage for bubble memories. 4,458,334, Cl. 365-1.000.
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Brandell, John T., 4,457,367, Cl. 166-105.000.
Burris, Wesley J., II, 4,457,377, Cl. 166-332.000.
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Hameister, Helen M. Display mounting assembly for collector plates. 4,457,484, Cl. 248-490.000.
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Hampp, Martin: *See*—
Papenhagen, Dieter; Wallentowitz, Henning; Lepler, Gerhard; and Hampp, Martin, 4,457,189, Cl. 74-513.000.
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Johansson, Fritz H.; and Hampton, Gordon P., 4,457,148, Cl. 70-278.000.
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Komoto, Shinzuke; and Haneishi, Yasuyuki, 4,457,608, Cl. 354-286.000.
Hanisch, Ferdinand: *See*—
Roenisch, Wolfgang; Klass, Joachim; Voigt, Hermann-Uwe; Hanisch, Ferdinand; van Hove, Cornelius; and Matzat, Horst, 4,458,105, Cl. 174-106.00D.
Hanks, Robert S.; and Brodrick, Philip H., to P.M. Plasmatic (Leicester) Limited. Valve cap tamper-proof cover. 4,457,445, Cl. 220-214.000.
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Hanson, David W.: *See*—
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Takezawa, Kenichiro; Harada, Mineo; and Kako, Yutaka, 4,457,635, Cl. 400-124.000.
Haramco Research, Inc.: *See*—
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Stanley, Robert W.; Monette, Serge; and Harris, Bryn, 4,457,897, Cl. 423-141.000.
Harris, Jeffery J.; and Greenwood, David I., to British Aerospace. Rangefinder. 4,457,621, Cl. 356-5.000.
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Hartmann, Johannes. Bag-packaging machine for bread. 4,457,124, Cl. 53-512.000.
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Hasegawa, Takeo, to Wakai & Co., Ltd. Nail. 4,457,651, Cl. 411-29.000.
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Geissler, Ulrich; Sprengel, Heide; Herwig, Walter; and Hasenjaeger, Manfred. 4,458,007, Cl. 430-284.000.
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Kataoka, Tsunehiko; Nagara, Yoshiaki; Hashimoto, Akira; Konishi, Masayuki; and Ogawa, Koichi, 4,458,018, Cl. 435-218.000.
Hashimoto, Masashi: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,458,078, Cl. 548-227.000.
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Hatakeyama, Yoshiharu: *See*—
Nakazawa, Hidezi; and Hatakeyama, Yoshiharu, 4,457,961, Cl. 428-35.000.

Hatchadoorian, Edward; Ostapchenko, George J.; Patton, James L.; and Young, Harlan S., to Du Pont de Nemours, E. I., and Company. Process for thermoforming reinforced polymer sheets. 4,457,797, Cl. 156-242.000.

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Inagaki, Mitsukane; Hattori, Mitsuhiro; and Ono, Hiromitsu, 4,457,675, Cl. 418-14.000.

Hattori, Tadamichi, to Tokai Seiki Co., Ltd. Valve means for gas lighter. 4,457,699, Cl. 431-344.000.

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Hattori, Yoshiyuki; Matsui, Kazuma; and Kinbara, Hiroji, to Nippondenso Co., Ltd. Torque transmission belt means. 4,457,742, Cl. 474-201.000.

Haub, Donald J.: *See*—
Carlson, Alfred D.; Haub, Donald J.; and Snetting, Mark E., 4,457,036, Cl. 15-49.00R.

Hauber, Peter. Buckle for child's car seat harness. 4,457,052, Cl. 24-656.000.

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Hauser, Hans, to MTD Products Inc. Shift lever mounting assembly. 4,457,188, Cl. 74-473.00P.

Hayashi, Hiroshi; and Komiya, Masanobu, to Asahi Kasei Kogyo Kabushiki Kaisha; and Dainippon Pharmaceutical Co., Ltd. Method for stabilizing Tumor Necrosis Factor and a stable aqueous solution or powder containing the same. 4,457,916, Cl. 424-101.000.

Haynes, James D.; Kwiatkowski, Jerome A.; and Mapes, Glenn H., to Ball Corporation. Management control system for forming glassware. 4,457,772, Cl. 65-160.000.

Hearn, David R.: *See*—
Sohval, A. Robert; Cooperstein, Gerald; Fleischer, David; Goldstein, Shyke A.; and Hearn, David R., 4,458,180, Cl. 315-111.810.

Heath, Harry G., Jr. Tamper evident child-resistant container closure. 4,457,437, Cl. 215-224.000.

Heber, Helmut: *See*—
Karges, Hermann E.; Heber, Helmut; Uhmann, Rainer; Teetz, Volker; and Geiger, Rolf, 4,457,866, Cl. 260-112.50R.

Heberlein Maschinenfabrik AG: *See*—
Simmen, Christian, 4,457,034, Cl. 8-151.200.

Heck, Albert E. Bow sight. 4,457,076, Cl. 33-265.000.

Hecon Corporation: *See*—
Bernstein, Marvin, 4,458,142, Cl. 235-381.000.

Hefner, Boby R. Plant pot. 4,457,104, Cl. 47-73.000.

Heger, Adolf: *See*—
Bobeth, Wolfgang; Heger, Adolf; and Passler, Helmar, 4,457,817, Cl. 204-159.150.

Heidemanns, Rolf-Peter: *See*—
Habel, Georg; Heidemanns, Rolf-Peter; and Muller, Hans-Jurgen, 4,457,278, Cl. 123-438.000.

Heidt, Alfred, to Frankl & Kirchner GMBH & Co KG Fabrik fur Electromotoren und electrische Apparate. Method of executing an address-jump command in a stored-program sequential-control system for processing machines, and in particular for industrial sewing machines, and sequential-control circuitry for the practice of the method. 4,458,332, Cl. 364-900.000.

Heikkila , Risto M.: *See*—
Tuovinen, Frans H.; Heikkila , Risto M.; Jankkila, Martti J.; Norrman, Bengt J. F.; and Honkaniemi, Matti E., 4,458,352, Cl. 373-101.000.

Heim, Tibor: *See*—
Swyer, Paul R.; Heim, Tibor; and Smith, John M., 4,457,310, Cl. 128-706.000.

Heiman, Frederic P., to Mars, Inc. Vending machine control and diagnostic apparatus. 4,458,187, Cl. 318-490.000.

Heinol, Alois R., to Knight Engineering & Molding Co. Dispensing cap. 4,457,458, Cl. 222-498.000.

Heinrich Bucher, Firma: *See*—
Bucher, Peter, 4,457,142, Cl. 62-388.000.

Heinze, Bjarne C. Shelving system and its production procedure. 4,457,239, Cl. 108-109.000.

Heinze, Walter O.; and Tufts, Wesley M., to International Water Saving Systems, Inc. Method and apparatus for filtering industrial and human waste. 4,457,849, Cl. 210-807.000.

Heitkamp, Herbert: *See*—
Unger, Eberhart; Heitkamp, Herbert; Hessel, Heinz; Plester, Karl-Heinz; and Lagodka, Manfred, 4,457,212, Cl. 92-18.000.

Heitmann, Jurgen, to Robert Bosch GmbH. Method of recording video signals within a predetermined bit/unit time recording rate. 4,458,272, Cl. 360-8.000.

Heliotronic Forshungs und Entwicklungsgesellschaft fur Solarzellen Grundstoffe mbH: *See*—
Dietl, Josef; Holm, Claus; Kotilge, Jorg; and Wohlschlager, Michael, 4,457,903, Cl. 423-350.000.

Helzer, Charles W.: *See*—
Sley, George S., 4,457,773, Cl. 71-33.000.

Hemmi, Keiji: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,458,078, Cl. 548-227.000.

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Fry, Scott M.; Hempy, Harry O.; Kirkpatrick, Charles R.; and Kittinger, Bruce E., 4,458,316, Cl. 364-200.000.

Hems, Colin E.; and Copsey, Ian S., to Gowrings Ltd. Vehicle entry system for invalids and a wheel chair suitable for use with the entry system. 4,457,663, Cl. 414-522.000.

Henderson, William D., to Otis Engineering Corporation. Packer for high temperature high pressure wells. 4,457,369, Cl. 166-125.000.

Hengesh, Harold F.; Marcier, Michael J.; and Van Zeeland, Anthony J., to Oak Industries, Inc. Connector for attaching an electrical component to a membrane keyboard. 4,458,123, Cl. 200-159.00B.

Henke, Mitchell C., to Lincoln Manufacturing Company, Inc. Power burner system for a food preparation oven. 4,457,291, Cl. 126-21.00A.

Henkel, Hans-Joachim; and Muller, Norbert, to Siemens Aktiengesellschaft. Electrical insulation II. 4,458,044, Cl. 524-100.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Conrad, Jens; Schaper, Ulf-Armin; and Zeidler, Ulrich, 4,457,944, Cl. 424-358.000.
Saran, Herbert, deceased; and Witthaus, Martin, 4,457,858, Cl. 252-182.000.
Tesmann, Holger; and Kachel, Helmut, 4,457,850, Cl. 252-61.000.

Hennenfent, Douglas J.; Holmstrand, Allan L.; and Kracke, Alan G., to Magnetic Peripherals Inc. Workpiece carrier. 4,457,114, Cl. 51-216.00R.

Herbertz, Toni: *See*—
Reinehr, Ulrich; Bernklau, Kurt; Burghartz, Hans K.; Herbertz, Toni; and Jungverdorben, Hermann-Josef, 4,457,885, Cl. 264-177.00F.

Herchenbach, Horst: *See*—
Ramesohl, Hubert; and Herchenbach, Horst, 4,457,705, Cl. 432-106.000.

Hercules Incorporated: *See*—
Espy, Herbert H., 4,458,042, Cl. 524-14.000.
Leach, Douglas R., 4,458,037, Cl. 521-124.000.

Herman, Samuel R.; and Fischer, Louis B., to McDonnell Douglas Corporation. Universal sleeve. 4,457,516, Cl. 277-12.000.

Hermann Berstorff Maschinenbau GmbH: *See*—
Koch, Klaus, 4,457,227, Cl. 100-117.000.

Hermann Hirsch Leder- und Kunststoffwarenfabrik: *See*—
Hirsch, Hermann; and Jarisch, Reinhart, 4,457,460, Cl. 224-178.000.

Heroux, Paul, to Hydro Quebec. Method and apparatus for eliminating pulsatory discharges of the corona effect along an electric power line when the conductors are wet. 4,458,107, Cl. 174-127.000.

Herring, Kathryn D., to American Hospital Supply Corporation. Blood gas control. 4,458,021, Cl. 436-11.000.

Herstein, Dov; and Rosenheck, Leonard S., to Microwave Semiconductor Corporation. Waveguide to microstrip coupler wherein microstrip carries D.C. biased component. 4,458,222, Cl. 333-26.000.

Herwig, Walter: *See*—
Geissler, Ulrich; Sprengel, Heide; Herwig, Walter; and Hasenjaeger, Manfred, 4,458,007, Cl. 430-284.000.
Mohr, Dieter; Herwig, Walter; Frass, Werner; and Usbeck, Gerhard, 4,458,005, Cl. 430-271.000.

Hessel, Heinz: *See*—
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Hettes, Frank J., to Weiler Brush Company. Industrial wire cup-shaped brush. 4,457,040, Cl. 15-180.000.

Hettinger, William P., Jr.: *See*—
Zandona, Oliver J.; Hettinger, William P., Jr.; Kovach, Stephen M.; and Beck, Hubert W., 4,457,833, Cl. 208-120.000.

Heward, Christopher B.: *See*—
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Hewlett-Packard Company: *See*—
Giles, Robert R., 4,458,255, Cl. 346-140.00R.
Mui, Paul K.; Smith, James H.; Woodard, Charles C.; and Albrecht, Laurence J., 4,458,282, Cl. 360-133.000.
Willis, Barry G.; Schleifer, Arthur; Bell, Norton W.; Dryden, Paul C.; Stefanski, Andrew; and Dorny, C. Nelson, 4,458,323, Cl. 364-582.000.

Heyman, Duane A., to BASF Wyandotte Corporation. Polymer dispersions and their uses. 4,458,050, Cl. 524-726.000.

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Ramlow, Gerhard G.; Heyman, Duane A.; and Grace, Oscar M., 4,458,038, Cl. 521-137.000.

Heymer, Gero: *See*—
Schimmel, Gunther; Gradl, Reinhard; and Heymer, Gero, 4,457,848, Cl. 210-724.000.

Heymes, Alain: *See*—
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Hidaka, Kunihiko: *See*—
Fukushima, Naoto; Iwata, Kazuroh; and Hidaka, Kunihiko, 4,457,409, Cl. 188-282.000.

Hilco House, Inc.: *See*—
Miller, Ronald L.; and Lin, Pierce T. J., 4,457,097, Cl. 446-327.000.

Hill, Charles C., to Luther Medical Products, Inc. Microprocessor controlled intravenous feed system. 4,457,750, Cl. 604-65.000.

Hill, Kenneth O.: *See*—
Johnson, Derwyn C.; Kawasaki, Brian S.; and Hill, Kenneth O., 4,457,581, Cl. 350-96.160.

Hill, Wesley B.: *See*—
Seibert, Willard J.; and Hill, Wesley B., 4,457,667, Cl. 415-174.000.

Hill, William E.; and McAuliffe, Charles A., to Facilitated Separations, Ltd. Managanese compounds and sorption of gases using manganese compounds. 4,457,898, Cl. 423-219.000.
Hilti Aktiengesellschaft: *See*—
Bereiter, Rolf, 4,457,842, Cl. 210-198.100.
Hings, Donald L. Geomagnetic prospecting method with measurements obtained during an internal of one to ten minutes time duration. 4,458,205, Cl. 324-345.000.
Hinson, Virgil H.: *See*—
Jarman, Davis R.; and Hinson, Virgil H., 4,457,159, Cl. 72-422.000.
Hiraga, Masaharu, to Sanden Corporation. Driving support mechanism for an orbiting scroll of a scroll type fluid displacement apparatus. 4,457,676, Cl. 418-55.000.
Hiraiwa, Hisao: *See*—
Sekiyama, Kenichi; Mishima, Yasuhiro; Hiraiwa, Hisao; and Segawa, Joichiro, 4,457,547, Cl. 293-110.000.
Hiramatsu, Takeo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Torque transmission device. 4,457,411, Cl. 192-0.076.
Hirano, Reiji: *See*—
Nakata, Shinichi; Takahashi, Hiroshi; Matsuyama, Shigeru; and Hirano, Reiji, 4,458,325, Cl. 364-705.000.
Hirano, Shigeo: *See*—
Yamamuro, Kiyohiko; Hirano, Shigeo; and Iwasa, Yasuo, 4,458,010, Cl. 430-393.000.
Hirasawa, Fusao: *See*—
Saito, Toshihiko; and Hirasawa, Fusao, 4,457,690, Cl. 431-1.000.
Hirobe, Hajime: *See*—
Katsuda, Yoshio; Hirobe, Hajime; and Minamite, Yoshihiro, 4,457,940, Cl. 424-274.000.
Hirosawa, Yoshiaki: *See*—
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Hirsch, Hermann; and Jarisch, Reinhart, to Hermann Hirsch Leder- und Kunststoffwarenfabrik. Wristwatch strap with protective layer that contacts the wrist. 4,457,460, Cl. 224-178.000.
Hirshfield, Jay L.; and Krishnan, Mahadevan, to Omega-P, Inc. Method and apparatus for separating substances of different atomic weights using a plasma centrifuge. 4,458,148, Cl. 250-284.000.
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Imamura, Yoshinobu; Ito, Hajime; Sato, Yoko; and Nakamori, Hiromichi, 4,457,945, Cl. 426-53.000.
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Fujita, Tsuyoshi; Komatsu, Shinichi; and Toda, Gyozo, 4,457,950, Cl. 427-43.100.
Fukuda, Minoru; Yamatani, Shigeru; Nishimura, Kotaro; and Endo, Akira, 4,458,348, Cl. 365-185.000.
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Takeuti, Susumu; Sakaguchi, Minoru; Aoyama, Takanobu; and Oishi, Kazuaki, 4,458,099, Cl. 174-27.000.
Takezawa, Kenichiro; Harada, Mineo; and Kako, Yutaka, 4,457,635, Cl. 400-124.000.
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Tabaru, Kazunori; and Noda, Noriyuki, 4,457,851, Cl. 252-62.630.
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Hodges, Marvin P., to B Optical. Fresnel lens projection system with high gain screen. 4,457,594, Cl. 350-452.000.
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Donges, Reinhard; and Horn, Klaus, 4,458,006, Cl. 430-283.000.
Draeger, Eberhard; and Lubbers, Henning, 4,457,936, Cl. 424-270.000.
Geissler, Ulrich; Sprengel, Heide; Herwig, Walter; and Hasenjaeger, Manfred, 4,458,007, Cl. 430-284.000.
Mohr, Dieter; Herwig, Walter; Frass, Werner; and Usbeck, Gerhard, 4,458,005, Cl. 430-271.000.
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Schimmel, Gunther; Gradl, Reinhard; and Heymer, Gero, 4,457,848, Cl. 210-724.000.
Skaletz, Detlef H., 4,457,810, Cl. 204-59.00R.
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Strupczewski, Joseph T., 4,458,076, Cl. 546-199.000.
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Davis, Larry; and Klein, Joseph T., 4,458,075, Cl. 546-198.000.
Hoehn, John W. Method and apparatus for depacking articles. 4,457,123, Cl. 53-492.000.
Hoekstra, George R.; and Forgac, John M., to Standard Oil Company. Transient response process for detecting in situ retorting conditions. 4,457,374, Cl. 166-251.000.
Hoeptner, Herbert W., III. Tensioner. 4,457,741, Cl. 474-138.000.
Hoffman, Alexander: *See*—
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Hofmann, Hans: *See*—
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Hohne, Dieter, to Druckerei Gorius. Multicolor printed product containing pearl luster pigment. 4,457,540, Cl. 283-94.000.
Holden, Scott C., to Varian Associates, Inc. Apparatus for gas-assisted, solid-to-solid thermal transfer with a semiconductor wafer. 4,457,359, Cl. 165-80.00C.
Holick, Michael F.; and Holick, Sally A., to General Hospital Corporation, The. Glycosides of vitamins A, E and K. 4,457,918, Cl. 424-180.000.
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Holl, Herbert B.; Roberts, Thomas G.; and Barr, Thomas A., Jr., to United States of America, Army. Variable output coupler for laser cavities with totally reflecting mirrors. 4,458,350, Cl. 372-108.000.
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Holtaway, Thomas S.: *See*—
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Holubka, Joseph W., to Ford Motor Company. Tertiary alcohol-diblocked diisocyanate urea urethane oligomers and coating compositions comprising same. 4,458,056, Cl. 525-528.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hattori, Torao, 4,457,413, Cl. 192-3.300.
Katayama, Hiroomi; Fujii, Masahiko; and Hirosawa, Yoshiaki, 4,457,286, Cl. 123-612.000.
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Erdman, John L., 4,457,692, Cl. 431-19.000.
Lane, Charles E., III, 4,458,257, Cl. 346-141.000.
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Holtey, Thomas O.; Kelly, Richard P.; and Noyes, Steven S., 4,458,308, Cl. 364-200.000.
Wilder, Richard P., Jr., 4,458,309, Cl. 364-200.000.
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Fare, Carlo, 4,458,191, Cl. 318-696.000.
Hong, Charles A.; and Brabbs, William J., to Procter & Gamble Company, The. Doughs and cookies providing storage-stable texture variability. 4,457,946, Cl. 426-94.000.
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Tuovinen, Frans H.; Heikkila , Risto M.; Jankkila, Martti J.; Norrman, Bengt J. F.; and Honkaniemi, Matti E., 4,458,352, Cl. 373-101.000.
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Hoppe, Joachim; and Haghiri-Tehrani, Yahya, to GAO Gesellschaft fur Automation and Organisation mbH. Method of incorporating IC modules into identification cards. 4,457,798, Cl. 156-248.000.
Horiba, Tatsuo; Takeuchi, Seizi; Tamura, Kohki; Kawamura, Go; and Kudo, Tetsuichi, to Hitachi, Ltd. Liquid fuel cell. 4,457,987, Cl. 429-41.000.
Horibata, Hiroshi; Sondresl, John W.; and Chu, Henry. Hopping and dancing shoes. 4,457,084, Cl. 36-7.800.
Horie, Masakatsu: *See*—
Amaya, Mikio; Kimura, Masatoshi; Kondo, Isao; and Horie, Masakatsu, 4,458,258, Cl. 346-153.100.
Horigome, Koichi; Okada, Seizo; Nishimura, Katsuji; and Yamamoto, Hachizou, to Sharp Kabushiki Kaisha. Teller machine having an alterable secondary memory. 4,458,317, Cl. 364-406.000.

Horino, Shigeo: *See*—
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Horio, Noriyasu: *See*—
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Horl, Manfred, to U.S. Philips Corporation. Distortion compensated cross-coupled differential amplifier circuit. 4,458,210, Cl. 330-254.000.
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Hornbaker, Edwin D.; and Jones, Jesse D., to Ethyl Corporation. Thermoplastic compositions of vinyl chloride polymers and imide containing polymers. 4,458,046, Cl. 524-399.000.
Horstmann, Winfried, to Robert Bosch GmbH. Method and circuit for the transmitting, recording, and/or reproducing of wide-band signals. 4,458,271, Cl. 358-310.000.
Horwath, Robert O.; and Irbe, Robert M., to Nabisco Brands, Inc. Process for preparing fructose from starch. 4,458,017, Cl. 435-94.000.
Hoshino, Hidekazu: *See*—
Kato, Michio; Takahashi, Hayao; and Hoshino, Hidekazu, 4,457,622, Cl. 356-237.000.
Hoshino, Yonesaku; and Niwa, Toshikazu, to Mitsubishi Jukogyo Kabushiki Kaisha. Tank for storage of a suspension. 4,457,332, Cl. 137-334.000.
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Hosokai, Tetsushi; Doinaga, Hajime; and Shiraishi, Hideo, to Toyo Kogyo Co., Ltd. Idling speed control system for internal combustion engine. 4,457,275, Cl. 123-339.000.
Hosomizu, Hiroshi: *See*—
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Houdaille Industries, Inc.: *See*—
Cady, Percy L., 4,457,196, Cl. 83-140.000.
Housand, Nancy C. Educational toy for developing manual dexterity. 4,457,722, Cl. 434-260.000.
Howard, H. Keith; and Sherrill, Jimmy L., to Tutco, Inc. Electric heater and coil support insulator therefor. 4,458,141, Cl. 219-532.000.
Howmedica, Inc.: *See*—
Borzone, Rocco R., 4,457,306, Cl. 128-303.00R.
Walker, Peter S., 4,457,301, Cl. 128-92.0BC.
Howse, Paul T., Jr.; Beasley, Byron E.; Jacques, M. Allan; and Snooks, Rupert J., Jr., to Monsanto Company. Nylon spin-texture process. 4,457,883, Cl. 264-168.000.
HR Textron Inc.: *See*—
Lins, Richard C., 4,457,328, Cl. 137-68.00R.
HRI, Inc.: *See*—
Abrams, Lawrence M., 4,457,829, Cl. 208-49.000.
Gendler, Jeffrey L., 4,457,831, Cl. 208-59.000.
Kydd, Paul H., 4,457,830, Cl. 208-50.000.
Hruby, Victor J.; Hadley, Mac E.; Heward, Christopher B.; and Sawyer, Tomi K., to University Patents, Inc. Synthetic analogues of α-melanotropin 4,457,864, Cl. 260-112.50R.
Hsu, Edward C. and Temple, Chester S., to PPG Industries, Inc. Treated glass fibers and nonwoven sheet-like mat and method. 4,457,785, Cl. 106-308.00N.
Huang, Ho-Chung; and Mawhinney, Daniel D., to RCA Corporation. Monolithic voltage controlled oscillator. 4,458,215, Cl. 331-117.00D.
Huang, Yun-Yang; and Rosinski, Edward J., to Mobil Oil Corporation. Extrusion die for shaped extrudate. 4,457,685, Cl. 425-461.000.
Hubbard, Leo J.; Hubbard, Raymond P.; and Strobel, Erwin J., to P.H.D. of Puerto Rico, Inc. Tractor apparatus. 4,457,463, Cl. 226-74.000.
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Huber, Manfred; and Schindler, Robert, to BASF Aktiengesellschaft. Package for recording media. 4,457,429, Cl. 206-394.000.
Hudson, Bobby D., deceased; and by Hudson, Bobby J., administratrix. Method for training gin saws and ginning ribs for cotton gins. 4,457,049, Cl. 19-48.00R.
Hudson, Bobby J., administratrix: *See*—
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Hudson, Sharon J., Jr., to Sharon Manufacturing Company. Fuel injection rail assembly. 4,457,280, Cl. 123-470.000.
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Partyka, Richard A.; and Hudyma, Thomas W., 4,458,079, Cl. 548-341.000.
Huebler, James E.: *See*—
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Huffman, George W., to Eli Lilly and Company. Preparation of 3-benzothienylglycines. 4,458,085, Cl. 549-51.000.
Hughes Aircraft Company: *See*—
Wong, Mon N.; and Taormina, Frank A., 4,458,217, Cl. 333-135.000.
Hughes, David W., to Dow Chemical Company, The. 9-Thiabicyclononanediisocyanates and polymers made therefrom. 4,458,061, Cl. 528-73.000.
Hughes Helicopters, Inc.: *See*—
Cohen, Edwin E., 4,457,734, Cl. 464-30.000.
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Hughes Tool Company: *See*—
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Humphries, Romilly H., to S.A.Y. Industries, Inc. Multiple bottle assembly. 4,457,426, Cl. 206-158.000.
Hunger, Walter. Trailer coupling. 4,457,531, Cl. 280-433.000.
Hungerford, Gordon P., to Mobil Oil Corporation. Film coating and biaxial orienting apparatus. 4,457,254, Cl. 118-34.000.
Hungerford, Robert E. Hand held and/or hard mounted weatherproof portable travel safe for full time protection of essential travel valuables. 4,457,240, Cl. 109-45.000.
Hunnibell, Kenneth L.: *See*—
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Hunter Douglas, Inc.: *See*—
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Hunter Douglas International N.V.: *See*—
Rocholl, Johan P.; and De Jong, Hendrikus, 4,457,965, Cl. 428-141.000.
Hunter, James W.; and Lavallee, Francois A., to General Electric Company. Flexible electroluminescent lamp device and phosphor admixture therefor. 4,458,177, Cl. 313-511.000.
Hunter, Joe S., to United States of America, Army. Multifunction sensor using thin film transistor transducers. 4,457,173, Cl. 73-510.000.
Hupp, Gerhard; and Mader, Helmut, to Mauser-Werke Oberndorf GmbH. Breech mechanism for automatic firearms. 4,457,092, Cl. 42-25.000.
Hurd, Stanley E., to Machine Development Company, Inc. Elevator conveyor. 4,457,422, Cl. 198-604.000.
Hurst, Nicholas W.: *See*—
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Huson, Gregory G.: *See*—
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Husson, Alan L.; and Uherek, Vladimir, to Westinghouse Electric Corp. Elevator system. 4,457,404, Cl. 187-29.000.
Hycom Incorporated: *See*—
Motley, David M.; and Salman, Naif D., 4,458,355, Cl. 375-82.000.
Hyde, Marshall. Aerial bomb. 4,457,233, Cl. 102-346.000.
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Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Refrigerated display case having ambient air defrost. 4,457,139, Cl. 62-256.000.
Ichikawa, Iwao, to Sony Corporation. Apparatus for feeding electric circuit elements. 4,457,451, Cl. 221-190.000.
Ichikawa, Kiyoshi; Tatsumi, Hiroshi; and Ida, Minoru, to Manten Co., Ltd. Wheelchair. 4,457,528, Cl. 280-242.0WC.
Ichikawa, Mitsuo: *See*—
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Idesawa, Masanori; and Yatagai, Toyohiko, to Rikagaku Kenkyusho. Apparatus for determining the position of a mark on an object. 4,457,626, Cl. 356-376.000.
IFE Gesellschaft m.b.H.: *See*—
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Ikegami, Akira: *See*—
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electrostatic photography and development process using the same. 4,457,995, Cl. 430-115.000.
Illinois Tool Works Inc.: *See—*
Sygnator, Henry A., 4,457,654, Cl. 411-408.000.
Imamura, Yoshinobu; Ito, Hajime; Sato, Yoko; and Nakamori, Hiromichi, to Hitachi Kiden Kogyo, Ltd. Mushroom growing by utilizing sewage sludge compost and re-utilization of the used compost as livestock feed. 4,457,945, Cl. 426-53.000.
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Imsand, Bruce E.; Thomas, Chris L.; and Dorfmueller, David D., to Intergraph Corporation. Banded vector to raster converter. 4,458,330, Cl. 364-900.000.
Imsdahl, Allan J. Trouble light stand. 4,458,304, Cl. 362-387.000.
Ina, Teruo: *See—*
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Inaba, Hajimu; Miyashita, Hideo; and Otsuka, Shoichi, to Fujitsu Fanuc Limited. Industrial robot having a function for controlling a current of a motor for driving. 4,458,188, Cl. 318-568.000.
Inagaki, Mitsukane; Hattori, Mitsuhiro; and Ono, Hiromitsu, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Volumetric fluid compressor device. 4,457,675, Cl. 418-14.000.
Inamori, Mikio: *See—*
Hanyu, Susumu; Inamori, Mikio; and Shomura, Eiichi, 4,457,246, Cl. 112-266.100.
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Initial Plastics Ltd.: *See—*
Whitmarsh, Herbert F., 4,457,561, Cl. 301-37.0SS.
Inoue, Akihiko: *See—*
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Institut Francais du Petrole: *See—*
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Nefedov, Anatoly P.; Oberman, Felix M.; Katoshin, Jury G.; Krugly, Semen I.; Maljuzhonok, Gennady P.; and Mikhailov, Jury S., 4,458,202, Cl. 324-204.000.
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Aichelmann, Frederick J., Jr.; and Lange, Lawrence K., 4,458,349, Cl. 371-13.000.
Amezcua, Robert; Clements, Silous F.; Dachowski, Richard P.; and Motola, Patrick D., 4,458,331, Cl. 364-900.000.
Ashbee, William H.; Beran, Mark A.; Colglazier, Donald F.; Janssen, Donovan M.; Mantey, John P.; Martin, Ronald J.; Patch, Gerald P.; Rittenhouse, Larry E.; and Valent, James A., 4,457,506, Cl. 271-3.100.
Bergeron, Steven F.; and Duncan, Bernard F., 4,457,820, Cl. 204-192.00E.
Bindra, Perminder S.; David, Allan P.; and Light, David N., 4,457,986, Cl. 429-40.000.
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Cunningham, Earl A., 4,458,280, Cl. 360-125.000.
Fry, Scott M.; Hempy, Harry O.; Kirkpatrick, Charles R.; and Kittinger, Bruce E., 4,458,316, Cl. 364-200.000.
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Boden, Richard M., 4,457,318, Cl. 131-276.000.
Hall, John B.; McGhie, Joseph A.; and Vock, Manfred H., 4,458,093, Cl. 568-378.000.
International Paper Company: *See—*
Sanford, Robert J., 4,457,744, Cl. 493-126.000.
International Telephone and Telegraph Corporation: *See—*
Dantzig, Jonathan A.; and Tyler, Derek E., 4,457,354, Cl. 164-468.000.
Winter, Joseph; Dantzig, Jonathan A.; and Tyler, Derek E., 4,457,355, Cl. 164-468.000.
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Heinze, Walter O.; and Tufts, Wesley M., 4,457,849, Cl. 210-807.000.
Inventive Technology International: *See—*
McSpadden, John T., 4,457,710, Cl. 433-81.000.
Iomega Corporation: *See—*
Johnson, Jerome P., 4,458,273, Cl. 360-74.100.
Irbe, Robert M.: *See—*
Horwath, Robert O.; and Irbe, Robert M., 4,458,017, Cl. 435-94.000.
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Takayama, Ryoichi; and Ise, Yukihiko, 4,458,170, Cl. 310-322.000.
Iseki, Masahide: *See—*
Nakajima, Tadanobu; Iseki, Masahide; and Yoshiyama, Toshio, 4,457,614, Cl. 355-3.00R.
Iseman Enterprises, Inc.: *See—*
Iseman, Richard W., 4,457,739, Cl. 474-49.000.
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Ishida, Torao, to Asahi Kasei Kogyo Kabushiki Kaisha. Physiologically active peptide. 4,457,867, Cl. 260-112.50R.
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Ikenoue, Shinpei; Ishii, Kazuo; and Kashiwabara, Akira, 4,457,995, Cl. 430-115.000.
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Ishikawa, Masanobu, to Aisin Seiki Kabushiki Kaisha. Up and down moving mechanism for an air spoiler associated with a movable grill. 4,457,558, Cl. 296-1.00S.
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Hamai, Kyugo; Nakagawa, Yasuhiko; Nakai, Meroji; Furukawa, Junichi; and Ishizuka, Takashi, 4,457,285, Cl. 123-598.000.
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Iwao, Junichi; Oya, Masayuki; Baba, Toshio; Iso, Tadashi; and Chiba, Takehisa, 4,457,935, Cl. 424-270.000.
Isogai, Tokio: *See—*
Iwanaga, Shoichi; Sato, Nobuo; Ikegami, Akira; Isogai, Tokio; Noro, Takanobu; and Arima, Hideo, 4,457,161, Cl. 73-23.000.
Isoring S.r.l.: *See—*
Valbonesi, Francesco, 4,457,687, Cl. 425-394.000.

Itek Corporation: *See*—
Greenleaf, Allen H.; and Watson, John T., 4,457,625, Cl. 356-360.000.
Ito, Etsuo: *See*—
Kawai, Kimitoshi; Sugawara, Kunio; and Morinaga, Tsuyoshi, 4,457,863, Cl. 260-112.00R.
Ito, Hajime: *See*—
Imamura, Yoshinobu; Ito, Hajime; Sato, Yoko; and Nakamori, Hiromichi, 4,457,945, Cl. 426-53.000.
Ito, Kenji; Shimba, Satoru; Tsuda, Yasuo; and Sugita, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide color photographic material. 4,458,012, Cl. 430-549.000.
Ito, Toshimitsu: *See*—
Kobayashi, Nobuyuki; and Ito, Toshimitsu, 4,457,283, Cl. 123-492.000.
Ito, Yoshinori: *See*—
Masaki, Masaru; Ito, Yoshinori; Inoue, Akihiko; and Toda, Munetaka, 4,457,157, Cl. 72-354.000.
Ito, Yukio: *See*—
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Kirino, Hisao; Yabumoto, Yukinobu; Iritani, Takashi; Suga, Masao; Nakanishi, Yukinaga; and Itoh, Masaru, 4,457,819, Cl. 204-181.00R.
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Itse, Daniel C.; and Penterson, Craig A., to Riley Stoker Corporation. Method of burning pulverized coal. 4,457,241, Cl. 110-347.000.
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Needham, Barbara, 4,457,796, Cl. 156-182.000.
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Ivaschenko, Alexandr V.; Lazareva, Valentina T.; Prudnikova, Elena K.; Rumyantsev, Vladimir G.; Pljusnina, Tamara S.; Nefedov, Viktor A.; Blinov, Lev M.; Titov, Viktor V.; Sevostyanov, Vladimir P.; and Shoshin, Vadim M. Mesomorphic material containing 2,2'-azoimidazole compounds containing 1,1'-benzylideneamino substituents. 4,457,859, Cl. 252-299.610.
Iwanaga, Shoichi; Sato, Nobuo; Ikegami, Akira; Isogai, Tokio; Noro, Takanobu; and Arima, Hideo, to Hitachi, Ltd. Gas detection device and method for detecting gas. 4,457,161, Cl. 73-23.000.
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Iwasa, Yasuo: *See*—
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Fukushima, Naoto; Iwata, Kazuroh; and Hidaka, Kunihiko, 4,457,409, Cl. 188-282.000.
Jack Macmanus Research Limited (Great Britain): *See*—
Brand, Frederick C., 4,457,876, Cl. 261-28.000.
Jackle, Eugen. Method and apparatus for locating pipeline damage. 4,457,163, Cl. 73-40.50A.
Jackson, Ronald M., to Tektronix, Inc. Programmable delay circuit. 4,458,165, Cl. 307-595.000.
Jacob, Neil R.: *See*—
Thrift, Peter R.; and Jacob, Neil R., 4,457,170, Cl. 73-304.00C.
Jacobs, William G.: *See*—
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Jacobson, Clayton J. Small watercraft starting arrangement. 4,457,726, Cl. 440-85.000.
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Howse, Paul T., Jr.; Beasley, Byron E.; Jacques, M. Allan; and Snooks, Rupert J., Jr., 4,457,883, Cl. 264-168.000.
Jaeger, Colleen S.: *See*—
Ornato, Joseph P.; Fennigkoh, Larry; and Jaeger, Colleen S., 4,457,312, Cl. 128-711.000.
Jaffe, Fred: *See*—
Hardy, Thomas A.; and Jaffe, Fred, 4,458,035, Cl. 521-107.000.
Jaffe, Michael; and Ophir, Zohar, to Celanese Corporation. Molded article comprised of a thermotropic liquid crystal line polymer with an inherently weak weld line incorporated therein. 4,457,962, Cl. 428-36.000.
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Zodrow, Rudolf, 4,457,801, Cl. 156-364.000.
Jagger, Brian E.: *See*—
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James, David L. Sound deflector for headset ear phones. 4,457,396, Cl. 181-136.000.
James, Larry R., to Allis-Chalmers Corp. Axial flow combine with single distribution auger. 4,457,316, Cl. 130-27.00Q.
Jankkila, Martti J.: *See*—
Tuovinen, Frans H.; Heikkila , Risto M.; Jankkila, Martti J.; Norrman, Bengt J. F.; and Honkaniemi, Matti E., 4,458,352, Cl. 373-101.000.
Jannemann, Theo: *See*—
Sommers, Hans; Berg, Hans; and Jannemann, Theo, 4,457,704, Cl. 432-29.000.
Janome Sewing Machine Co., Ltd.: *See*—
Hanyu, Susumu; Inamori, Mikio; and Shomura, Eiichi, 4,457,246, Cl. 112-266.100.
Janssen, Donovan M.: *See*—
Ashbee, William H.; Beran, Mark A.; Colglazier, Donald F.; Janssen, Donovan M.; Mantey, John P.; Martin, Ronald J.; Patch, Gerald P.; Rittenhouse, Larry E.; and Valent, James A., 4,457,506, Cl. 271-3.100.
Janssens, Wilhelmus; Thiers, Christiaan G.; and Liekens, Wilfried F., to AGFA-Gevaert, N.V. Method and materials for improving the color balance of photographic multicolor images using contact screen. 4,458,002, Cl. 430-236.000.
Jansson, Robert E.: *See*—
Rogers, Thomas E.; Jansson, Robert E.; and Baizer, Manuel M., 4,457,813, Cl. 204-74.000.
Japan Atomic Energy Research Institute: *See*—
Ando, Toshinari; Nishi, Masataka; Takahashi, Yoshikazu; and Shimamoto, Susumu, 4,458,106, Cl. 174-126.00S.
Japan Oxygen Co., Ltd.: *See*—
Ishii, Hiroshi; Morii, Hiroshi; and Ishijima, Saburo, 4,457,488, Cl. 251-133.000.
Jarisch, Reinhart: *See*—
Hirsch, Hermann; and Jarisch, Reinhart, 4,457,460, Cl. 224-178.000.
Jarman, Davis R.; and Hinson, Virgil H. Sheet metal pull clamp. 4,457,159, Cl. 72-422.000.
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., to Eaton Corporation. Thermally protected semiconductor with accurate phase control. 4,458,287, Cl. 361-103.000.
Jasys, Vytautas J.; and Kellogg, Michael S., to Pfizer, Inc. 1,1-Alkanediol dicarboxylate linked antibacterial agents. 4,457,924, Cl. 424-226.000.
Jax, Ltd.: *See*—
Stevenson, Richard L., 4,457,512, Cl. 273-148.00A.
Jenkins, William A., to Monarch Marking Systems, Inc. Composite label web rolls and method of making same. 4,457,981, Cl. 428-41.000.
Jering, Helmut; Becker, Udo; and Roeschlau, Peter, to Boehringer Mannheim GmbH. Reagent for the optical determination of the blood coagulation. 4,458,015, Cl. 435-13.000.
Jodrey, Robert M.; and Croci, Paul, to Dennison Manufacturing Company. Bottle cooler. 4,457,079, Cl. 34-105.000.
Johannesen, Donald D., to Bendix Corporation, The. Brake control mechanism. 4,457,412, Cl. 192-13.00A.
Johansson, Arnold: *See*—
Vogl, Georg; Moller, Bo; Pettersson, Erland; and Johansson, Arnold, 4,458,147, Cl. 250-233.000.
Johansson, Fritz H.; and Hampton, Gordon P. Electronic digital combination lock. 4,457,148, Cl. 70-278.000.
John Fluke Mfg. Co., Inc.: *See*—
Goyal, Ramesh C.; and Turnbull, Thomas H., 4,458,196, Cl. 324-57.00R.
John Zink Company: *See*—
Schwartz, Robert E.; Noble, Roger K.; and Keller, Michael R., 4,457,696, Cl. 431-202.000.
Johns, Calvin E., to Otis Elevator Company. Car and hoistway door coupling apparatus. 4,457,405, Cl. 187-52.0LC.
Johnson, Clyde T. Cycle kickstand accessory. 4,457,530, Cl. 280-293.000.
Johnson, Derwyn C.; Kawasaki, Brian S.; and Hill, Kenneth O., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Passive fiber optic data bus configurations. 4,457,581, Cl. 350-96.160.
Johnson, George W., to Lockheed Corporation. Sealant applicator for multi-length fasteners. 4,457,260, Cl. 118-711.000.
Johnson, James C., to Cooper Industries, Inc. Lead-type ballast apparatus with improved power factor for operating a high-intensity-discharge sodium lamp. 4,458,181, Cl. 315-247.000.
Johnson, Jerome P., to Iomega Corporation. Magnetic disk drive control apparatus and method. 4,458,273, Cl. 360-74.100.
Johnson, Lloyd D.; and Raudat, John L., to Standard-Knapp, Inc. Continuous motion bottle packer. 4,457,121, Cl. 53-56.000.
Johnson, Ronald L., to General Electric Company. Control device and methods of operating such. 4,458,117, Cl. 200-83.00P.
Johnston, Byron E.: *See*—
Grotyohann, Richard G.; Johnston, Byron E.; and Schlinger, Robin, 4,457,899, Cl. 423-321.00S.
Johnston, Robert W., to Black & Webster, Inc. Safety system. 4,457,418, Cl. 192-129.00B.
Jolliffe, Raymond: *See*—
Willey, Michael R.; and Jolliffe, Raymond, 4,458,239, Cl. 340-540.000.
Jones, Alan: *See*—
Dabill, David W.; Gentry, Stephen J.; Hurst, Nicholas W.; Jones, Alan; and Walsh, Peter T., 4,457,954, Cl. 427-125.000.
Jones, Darrell L. Valve position control device. 4,457,268, Cl. 123-90.230.
Jones, Jesse D.: *See*—
Hornbaker, Edwin D.; and Jones, Jesse D., 4,458,046, Cl. 524-399.000.
Jones, John E.; and Glenn, William K., III, to Singer Company, The. Carpet cleaning power head device. 4,457,042, Cl. 15-322.000.
Jones, Robert L.; and Wilson, Norman H., to National Research Development Corporation. Prostaglandins. 4,458,091, Cl. 562-502.000.
Jonsson, Ragnar. Method and apparatus for controlling an AC induction motor. 4,458,193, Cl. 318-803.000.

Jorgensen, Jorgen A.; and Nygren, Donald W., to Northland Aluminum Products, Inc. Portable oven air circulator. 4,457,292, Cl. 126-21.00A.

Josefsson, Lars-Goran: *See*—
Filipsson, Hans A. V.; and Josefsson, Lars-Goran, 4,458,246, Cl. 343-7.600.

Josephs, Richard M.; and Wang, Tsing-Chow, to Sperry Corporation. High gain Josephson junction voltage amplifier. 4,458,160, Cl. 307-306.000.

Jouaire, Alain: *See*—
Guichard, Michel; and Jouaire, Alain, 4,458,135, Cl. 219-127.000.

Jouanin, Andre: *See*—
Faure, Michel; Lumineau, Yves; and Jouanin, Andre, 4,457,770, Cl. 65-3.120.

Jouanna, Paul: *See*—
Crosnier, Bernard; Duruisseaud, Pierre; Fras, Gilles; Jouanna, Paul; and Portales, Jean-Luc, 4,458,245, Cl. 340-853.000.

Juan, Juan J. S.; and Valentin, Vicente M., to Coulter Electronics, Inc. Multiprogrammable pinch valve module. 4,457,339, Cl. 137-624.160.

Juby, Peter F.; Hudyma, Thomas W.; and Colton, Douglas G., to Bristol-Myers Company. Anti-ulcer agents. 4,457,932, Cl. 424-251.000.

Judell, Neil H.; Abbe, Robert C.; Poduje, Noel S.; and Mallory, Roy, to ADE Corporation. Wafer alignment station. 4,457,664, Cl. 414-779.000.

Jung, Rolf; and Wienen, Walter, to Krauss u. Reichert GmbH & Co. KG Spezialmaschinenfabrik. Web laying apparatus. 4,457,505, Cl. 270-30.000.

Jungverdorben, Hermann-Josef: *See*—
Reinehr, Ulrich; Bernklau, Kurt; Burghartz, Hans K.; Herbertz, Toni; and Jungverdorben, Hermann-Josef, 4,457,885, Cl. 264-177.00F.

Junkins, Philip D.: *See*—
Tward, Emanuel; and Junkins, Philip D., 4,458,292, Cl. 361-283.000.

Jurgens, Erwin: *See*—
von Hagen, Wolf-Rudiger; Jurgens, Erwin; and Bauer, Helmut, 4,457,247, Cl. 112-302.000.

Justus, Lowell. Pipe coupling apparatus. 4,457,543, Cl. 285-236.000.

Jyomura, Shigeru: *See*—
Takeuchi, Hiroshi; Ito, Yukio; Yamamoto, Etsuji; Jyomura, Shigeru; and Ashida, Sakichi, 4,458,172, Cl. 310-334.000.

K B Weecan Marine: *See*—
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Kabashima, Katsuhiko: *See*—
Takemae, Yoshihiro; Nozaki, Shigeki; Mezawa, Tsutomu; Kabashima, Katsuhiko; and Enomoto, Seiji, 4,458,337, Cl. 365-189.000.

Kabelac, William J.; and Sanders, Ian L., to International Business Machines Corporation. Detector structure for ion-implanted contiguous-disk bubble devices. 4,458,335, Cl. 365-8.000.

Kabelmetal Electro GmbH: *See*—
Roenisch, Wolfgang; Klass, Joachim; Voigt, Hermann-Uwe; Hanisch, Ferdinand; van Hove, Cornelius; and Matzat, Horst, 4,458,105, Cl. 174-106.00D.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Yamamura, Takashige; and Matsumoto, Satosi, 4,457,156, Cl. 72-316.000.
Yanagihara, Toshio; and Tominaga, Tsunekichi, 4,457,802, Cl. 156-405.100.

Kabushiki Kaisha Matsushiro: *See*—
Matsushiro, Yukimitsu, 4,457,101, Cl. 446-456.000.

Kabushiki Kaisha Morita Seisakusho: *See*—
Beach, Raymond D., 4,457,502, Cl. 269-11.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Inagaki, Mitsukane; Hattori, Mitsuhiro; and Ono, Hiromitsu, 4,457,675, Cl. 418-14.000.

Kachel, Helmut: *See*—
Tesmann, Holger; and Kachel, Helmut, 4,457,850, Cl. 252-61.000.

Kaiser, Paul: *See*—
Sudrabin, Leon P.; and Kaiser, Paul, 4,457,821, Cl. 204-196.000.

Kako, Yutaka: *See*—
Takezawa, Kenichiro; Harada, Mineo; and Kako, Yutaka, 4,457,635, Cl. 400-124.000.

Kamachi, Hajime; Okumura, Jun; and Naito, Takayuki, to Bristol-Myers Company. 3-Quaternary ammonium methyl)-substituted cephalosporin derivatives. 4,457,929, Cl. 424-246.000.

Kameyama, Nobuyuki: *See*—
Sekine, Jiro; Komatsuzaki, Hiroshi; Hara, Hiroshi; and Kameyama, Nobuyuki, 4,457,607, Cl. 354-203.000.

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Kuriyama, Shigeru; and Kaminaga, Minoru, 4,458,186, Cl. 318-341.000.

Kaminstein, Bernard. Place mat. 4,457,964, Cl. 428-43.000.

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Sugita, Toshio; and Kamiyama, Masahide, 4,458,154, Cl. 250-484.100.

Kanebo, Ltd.: *See*—
Matsui, Masao; Naito, Hiroshi; and Okamoto, Kazuo, 4,457,973, Cl. 428-372.000.

Kanebo Synthetic Fibers Ltd.: *See*—
Matsui, Masao; Naito, Hiroshi; and Okamoto, Kazuo, 4,457,973, Cl. 428-372.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Yamane, Kazumasa; and Kobayashi, Masahiro, 4,458,060, Cl. 526-292.300.

Kaneko, Eiji: *See*—
Yanabu, Satoru; Tamagawa, Tohoru; Kaneko, Eiji; and Funahashi, Takumi, 4,458,121, Cl. 200-148.00R.

Kanno, Tatsuya; and Toga, Yuzo, to Daicel Chemical Industries, Ltd. 2-Methyl-1,3-propylene glycol mono- or di-alkylene oxide ether. 4,458,063, Cl. 528-418.000.

Kanno, Yoshimitsu: *See*—
Yoshida, Kunio; Kotera, Hiroaki; Tsuda, Yukifumi; Kanno, Yoshimitsu; and Naka, Motohiko, 4,458,265, Cl. 358-80.000.

Kanto Yakin Kogyo Kabushiki Kaisha: *See*—
Takahashi, Susumu, 4,457,493, Cl. 266-81.000.

Kanzaka, Yoshihiro, to Yoshida Kogyo K.K. Snap-fit button. 4,457,050, Cl. 24-108.000.

Kapp, Joachim-Friedrich: *See*—
Biere, Helmut; Kapp, Joachim-Friedrich; and Bottcher, Irmgard, 4,457,927, Cl. 424-245.000.

Kapustay, John B., Jr.: *See*—
Booz, A. David; Barch, Daniel R.; Cebulak, Walter S.; Kapustay, John B., Jr.; and Sartschev, Adam J., 4,457,881, Cl. 264-12.000.

Kara, Stephen. Magnetic tape head cleaning apparatus. 4,458,281, Cl. 360-128.000.

Karges, Hermann E.; Heber, Helmut; Uhmann, Rainer; Teetz, Volker; and Geiger, Rolf, to Behringwerke Aktiengesellschaft. Chromogenic compounds and their use as enzyme substrates. 4,457,866, Cl. 260-112.50R.

Karis, Arthur T.; and Eberth, Peter J., to Beloit Corporation. Integral paper collection and transfer assembly. 4,457,657, Cl. 414-45.000.

Karl Lautenschlager K.G., Mobelbeschlagfabrik: *See*—
Lautenschlager, Karl, 4,457,047, Cl. 16-288.000.

Karl Pfisterer Elektrotechnische Spezialartikel GmbH & Co. KG: *See*—
Hockele, Max; Torpe, Wolfgang G.; and Beham, Karl, 4,457,063, Cl. 29-520.000.

Karlson, Lars G.: *See*—
Donaldson, John M.; Vidosh, Donn E.; Karlson, Lars G.; and Thomas, Dennis A., 4,457,400, Cl. 182-234.000.

Karnischer, Tamas: *See*—
Fekete, Kalman; Karnischer, Tamas; Malovecz, Istvan; Tuba, Istvan; Lukasics, Bela; Makk nee Petranyi, Magdolna; Princz, Zoltan; and Szabo, Antal, 4,457,759, Cl. 8-94.160.

Karreman, Jacob: *See*—
Acda, Petrus M.; and Karreman, Jacob, 4,457,886, Cl. 264-249.000.

Kasevich, Raymond S.; Kolker, Myer; and Dwyer, Arthur S., to Raytheon Company. In situ radio frequency selective heating system. 4,457,365, Cl. 166-60.000.

Kashimoto, Hiroo; Kosa, Tadatoshi; Inoue, Akihiko; Yamamoto, Shigemitu; and Kuroishi, Katuhiko, to Sumitomo Electric Industries, Ltd.; and Osaka Gas Company Limited. Piercing fluid-tight connector. 4,458,108, Cl. 174-152.00R.

Kashiwabara, Akira: *See*—
Ikenoue, Shinpei; Ishii, Kazuo; and Kashiwabara, Akira, 4,457,995, Cl. 430-115.000.

Kataishi, Takao; and Yokoi, Nobufumi, to Misawa Home Co., Ltd. Stirring apparatus. 4,457,628, Cl. 366-67.000.

Kataoka, Tsunehiko; Nagara, Yoshiaki; Hashimoto, Akira; Konishi, Masayuki; and Ogawa, Koichi, to Eisai Co., Ltd. Process for purifying elastase. 4,458,018, Cl. 435-218.000.

Katayama, Hiroomi; Fujii, Masahiko; and Hirosawa, Yoshiaki, to New Nippon Electric Co., Ltd.; and Honda Gikeh Kogyo Kabushiki Kaisha. Engine ignition system. 4,457,286, Cl. 123-612.000.

Katayama, Shitomi; Shimabukuro, Hajime; Nomura, Suguru; Kurita, Hiroyuki; and Ohno, Akira, to NHK Spring Co., Ltd. Reflector and method for manufacturing the same. 4,457,587, Cl. 350-288.000.

Katayama, Shitomi: *See*—
Shimabukuro, Hajime; Watanabe, Shuichi; Katayama, Shitomi; and Ohno, Akira, 4,457,598, Cl. 350-288.000.

Kato, Michio; Takahashi, Hayao; and Hoshino, Hidekaza, to NHK Spring Co., Ltd. Screw inspection device. 4,457,622, Cl. 356-237.000.

Kato, Motohiko: *See*—
Yamaji, Nobuyuki; Tahara, Kyoko; and Kato, Motohiko, 4,458,067, Cl. 536-27.000.

Katoshin, Jury G.: *See*—
Nefedov, Anatoly P.; Oberman, Felix M.; Katoshin, Jury G.; Krugly, Semen I.; Maljuzhonok, Gennady P.; and Mikhailov, Jury S., 4,458,202, Cl. 324-204.000.

Katsuda, Yoshio; Hirobe, Hajime; and Minamite, Yoshihiro, to Dainippon Jochugiku Kabushiki Kaisha. Carboxylic acid ester derivatives, process for manufacturing said derivatives, insecticides and acaricides containing said derivatives, and method for killing insects and acarina by treating therewith. 4,457,940, Cl. 424-274.000.

Katsuoka, Tatsuzo, to Yamaha Hatausoki Kabushiki Kaisha. Front cowling for motorcycles with deflectors for heated air. 4,457,552, Cl. 296-78.100.

Katz, Eric R., to Magnex Corporation. Thin film transducer and method of making same. 4,458,279, Cl. 360-123.000.

Kaufman, Peter; Sharkey, John J.; and Echols, John, to Essex-Tec Corporation. Pressure sensitive electric signal generator. 4,458,173, Cl. 310-338.000.

Kavesh, Sheldon: *See*—
Harpell, Gary A.; Kavesh, Sheldon; Palley, Igor; and Prevorsek, Dusan C., 4,457,985, Cl. 428-224.000.

Kawada, Hiroshi: *See*—
Hasebe, Nobuhisa; Kawada, Hiroshi; and Komine, Isamu, 4,457,356, Cl. 164-478.000.

Kawaguchi, Shoichi, to Komori Printing Machinery Co., Ltd. Phase adjusting apparatus of sheet-fed rotary printing press with turn-over mechanism. 4,457,231, Cl. 101-230.000.

Kawai, Kimitoshi; Sugawara, Kunio; and Morinaga, Tsuyoshi, to Daicel Chemical Industries, Ltd.; Sapporo Breweries Ltd.; and Ito, Etsuo. Antitumor substance. 4,457,863, Cl. 260-112.00R.

Kawakubo, Shoji: *See*—
Kawamoto, Mineo; Murakami, Kanji; Itoh, Yutaka; Matsuda, Youichi; Wajima, Motoyo; Morishita, Hirosada; Kawakubo, Shoji; and Yoshimura, Toyofusa, 4,457,952, Cl. 427-98.000.

Kawamoto, Mineo; Murakami, Kanji; Itoh, Yutaka; Matsuda, Youichi; Wajima, Motoyo; Morishita, Hirosada; Kawakubo, Shoji; and Yoshimura, Toyofusa, to Hitachi, Ltd. Process for producing printed circuit boards. 4,457,952, Cl. 427-98.000.

Kawamura, Go: *See*—
Horiba, Tatsuo; Takeuchi, Seizi; Tamura, Kohki; Kawamura, Go; and Kudo, Tetsuichi, 4,457,987, Cl. 429-41.000.

Kawamura, Masaharu: *See*—
Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; Sakai, Shinji; Uchiyama, Takashi; and Momiyama, Kikuo, 4,457,612, Cl. 354-471.000.

Kawano, Akihiro; and Terauchi, Kiyoshi, to Sanden Corporation. High efficiency scroll type compressor with wrap portions having different axial heights. 4,457,674, Cl. 418-5.000.

Kawasaki, Brian S.: *See*—
Johnson, Derwyn C.; Kawasaki, Brian S.; and Hill, Kenneth O., 4,457,581, Cl. 350-96.160.

Kawate, Yousuke, to Nippon Densan Corp. Brushless D.C. motor having asymmetrically positioned poles. 4,458,184, Cl. 318-254.000.

Kawazoe, Michio. Camera pan head with tilt tension control. 4,457,610, Cl. 354-293.000.

Kazuo, Itoi: *See*—
Fumio, Mori; Yoshiaki, Omura; Takashi, Nishida; and Kazuo, Itoi, 4,458,090, Cl. 560-124.000.

Keeling, Ronald J.: *See*—
Blasing, Elmer P.; Keeling, Ronald J.; and Roe: Jin-Young K., 4,458,062, Cl. 528-254.000.

Kegg, Jack P. Castor having inwardly cambered wheels and a retainer plate. 4,457,045, Cl. 16-18.00A.

Keiper Automobiltechnik GmbH & Co. KG: *See*—
Klingelhofer, Margret, 4,457,556, Cl. 297-362.000.

Keller, Michael R.: *See*—
Schwartz, Robert E.; Noble, Roger K.; and Keller, Michael R., 4,457,696, Cl. 431-202.000.

Kelley, Laurence J., to Comerco, Inc. J-Shaped wall rail system. 4,457,436, Cl. 211-88.000.

Kellogg, Michael S.: *See*—
Jasys, Vytautas J.; and Kellogg, Michael S., 4,457,924, Cl. 424-226.000.

Kelly, John A.: *See*—
Lorenc, Walter F.; Kelly, John A.; and Mandel, Frederick S., 4,457,847, Cl. 210-698.000.

Kelly, John J.; and Hughes, Jeremy R., to Lucas Industries Limited. Pipe coupling. 4,457,541, Cl. 285-23.000.

Kelly, Richard P.: *See*—
Holtey, Thomas O.; Kelly, Richard P.; and Noyes, Steven S., 4,458,308, Cl. 364-200.000.

Kelly, Robert C., to Upjohn Company, The. Cyclo pentene derivatives. 4,458,083, Cl. 548-478.000.

Kelly, Robert C., to Upjohn Company, The. Cyclopentene derivatives. 4,458,084, Cl. 548-478.000.

Kelly, Robert C., to Upjohn Company, The. Cyclopentene derivatives. 4,458,089, Cl. 560-115.000.

Kendall Company, The: *See*—
Steigerwald, Carl J., 4,457,487, Cl. 251-117.000.
Wichman, Cynthia A., 4,457,024, Cl. 2-51.000.

Kennecott Corporation: *See*—
Caul, Lawrence D., 4,457,766, Cl. 51-298.000.

Kenny, Andrew A.; and Peloza, Kirk B., to Eaton Corporation. Throttle operated controller assembly. 4,458,116, Cl. 200-61.890.

Kern, Calvin V.; and Zepp, Lawrence P. Hydraulic trim tile system for outboard propulsion units using a pressure amplifier. 4,457,725, Cl. 440-61.000.

Kern, Eugene B.; and Westwood, William B. Nose bleed clip. 4,457,756, Cl. 604-286.000.

Kernforschungsanlage Julich GmbH: *See*—
Krosschnabel, Hartmut, 4,457,064, Cl. 29-564.700.

Kernforschungszentrum Karlsruhe: *See*—
Koehler, Wolfgang; Blocher, Hans-Joachim; and Weiss, Eberhard, 4,457,388, Cl. 180-9.480.

Kerr-McGee Chemical Corporation: *See*—
Rado, Theodore A., 4,457,812, Cl. 204-66.000.

Keystone International, Inc.: *See*—
Scobie, William B., 4,457,490, Cl. 251-174.000.

Kidde Consumer Durables Corp.: *See*—
Belinkoff, Irving R., 4,458,140, Cl. 219-497.000.

Kidde, Inc.: *See*—
Andrews, Harry J., 4,457,633, Cl. 374-209.000.

Kikkoman Corporation: *See*—
Yamaji, Nobuyuki; Tahara, Kyoko; and Kato, Motohiko, 4,458,067, Cl. 536-27.000.

Kikuchi, Yobsiki; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Magnetic image recording device. 4,458,252, Cl. 346-74.400.

Kimber, Edward G.; and Norris, Peter C., to Tridon Limited. Retaining systems for squeegee assemblies in windshield. 4,457,041, Cl. 15-250.420.

Kimoto, Toyoki: *See*—
Watanabe, Kenkichi; Furuya, Katsuke; and Kimoto, Toyoki, 4,457,321, Cl. 133-8.00A.

Kimura, Makoto: *See*—
Tomino, Naoki; Kimura, Makoto; Magariyama, Kenichi; and Shiokama, Yoshiharu, 4,457,609, Cl. 354-286.000.

Kimura, Masatoshi: *See*—
Amaya, Mikio; Kimura, Masatoshi; Kondo, Isao; and Horie, Masakatsu, 4,458,258, Cl. 346-153.100.

Kinbara, Hiroji: *See*—
Hattori, Yoshiyuki; Matsui, Kazuma; and Kinbara, Hiroji, 4,457,742, Cl. 474-201.000.

Kinder, Mark R.; and Moorman, David S., to TRW Inc. Fluid drive mechanism. 4,457,678, Cl. 418-61.00B.

Kinetronic Industries, Inc.: *See*—
Knabel, Walter; and D'Antonio, Nicholas F., 4,458,157, Cl. 307-119.000.

King, Derrick O.: *See*—
Braithwaite, John D.; King, Derrick O.; Williams, Sidney J.; and Prior, James, 4,457,642, Cl. 401-188.00R.

King, William E., Jr.: *See*—
Carr, Norman L.; Prudich, Michael E.; King, William E., Jr.; and Moon, William G., 4,457,826, Cl. 208-8.0LE.

Kino, Gordon S.; Behar, David; Bowers, John E.; and Olaisen, Hermund, to United States of America, Navy. Adaptive filter using an ASW storage correlator. 4,458,328, Cl. 364-825.000.

Kino, Mitsutaro, to Fuji Foods Engineering Co., Ltd. Apparatus for stripping onions. 4,457,224, Cl. 99-516.000.

Kinoshita, Mitsuo, to Fujitsu Fanuc Limited. Method and apparatus for circular interpolation. 4,458,326, Cl. 364-723.000.

Kirby, Robert E.; and Brewer, Jacob L. Circular containment system for well drilling fluid. 4,457,627, Cl. 366-65.000.

Kirino, Hisao; Yabumoto, Yukinobu; Iritani, Takashi; Suga, Masao; Nakanishi, Yukinaga; and Itoh, Masaru, to Nippon Paint Co., Ltd.; and Nippon Light Metal Company Ltd. Method of delustering an electrocoated article. 4,457,819, Cl. 204-181.00R.

Kirkis, Peter G., to Vulcan Industrial Packaging Limited. Plastic pail and lid. 4,457,447, Cl. 220-306.000.

Kirkpatrick, Charles R.: *See*—
Fry, Scott M.; Hempy, Harry O.; Kirkpatrick, Charles R.; and Kittinger, Bruce E., 4,458,316, Cl. 364-200.000.

Kirkpatrick, William R., to Rosemount Inc. Electric heater arrangement for fluid flow stream sensors. 4,458,137, Cl. 219-201.000.

Kirst, Herbert A., to Eli Lilly and Company. 7-N-(Substituted-apramycin antibiotic derivatives and intermediates therefor. 4,458,065, Cl. 536-16.800.

Kishimoto, Juji: *See*—
Sado, Ichiro; and Kishimoto, Juji, 4,458,243, Cl. 340-756.000.

Kisler, Semyon; Chirokas, Edwin A.; and Foster, Donald A., to Polaroid Corporation. Precharged web costing apparatus. 4,457,256, Cl. 118-621.000.

Kitabayashi, Seiichi. Throwaway type gas lighter. 4,457,697, Cl. 431-254.000.

Kitagawa, Hiroji, to Kitagawa Industries Co., Ltd. Flat cable clamp. 4,457,482, Cl. 248-74.300.

Kitagawa Industries Co., Ltd.: *See*—
Kitagawa, Hiroji, 4,457,482, Cl. 248-74.300.

Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, to Fujisawa Pharmaceutical Company, Ltd. Oxazole derivatives. 4,458,078, Cl. 548-227.000.

Kitsugi, Naomichi; Fujinaga, Teruo; and Otsuka, Toyozo, to Central Glass Company, Limited. Method of refining silicon tetrafluoride gas. 4,457,901, Cl. 423-341.000.

Kittinger, Bruce E.: *See*—
Fry, Scott M.; Hempy, Harry O.; Kirkpatrick, Charles R.; and Kittinger, Bruce E., 4,458,316, Cl. 364-200.000.

Kitz Corporation: *See*—
Blomgren, Erne, 4,457,204, Cl. 89-1.00B.

Klann, Paul A. Heating model. 4,457,296, Cl. 126-417.000.

Klass, Joachim: *See*—
Roenisch, Wolfgang; Klass, Joachim; Voigt, Hermann-Uwe; Hanisch, Ferdinand; van Hove, Cornelius; and Matzat, Horst, 4,458,105, Cl. 174-106.00D.

Klausz, Remy, to Thomson-CSF. Reference detector device for a multidetector tomodensitometer and tomodensitometer comprising such a device. 4,458,358, Cl. 378-19.000.

Klein, Joseph T.: *See*—
Davis, Larry; and Klein, Joseph T., 4,458,075, Cl. 546-198.000.

Klein, Warren Z. Dental bridge and method of dental bridge fabrication. 4,457,714, Cl. 433-180.000.

Kleinewegers GmbH: *See*—
Pav, Josef, 4,457,057, Cl. 29-116.0AD.

Klement, Ekkehard; and Wittmann, Julius, to Siemens Aktiengesellschaft. Method for positioning and fixing optical components relative to one another. 4,457,467, Cl. 228-103.000.

Klingelhofer, Margret, to Keiper Automobiltechnik GmbH & Co. KG. Fitting for adjustably connecting parts of automotive vehicle seats. 4,457,556, Cl. 297-362.000.

Klochko, Stephen, to Wolverine Technology, Inc. Apparatus for breaking pavement. 4,457,645, Cl. 404-90.000.

Klockner-Humboldt-Deutz AG: *See*—
Maier, Martin; and Ruprecht, Hermann, 4,457,127, Cl. 56-192.000.
Ramesohl, Hubert; and Herchenbach, Horst, 4,457,705, Cl. 432-106.000.

Kloeppel, Joachim: *See*—
Eder, Wilhelm; Hofmann, Hans; Kloeppel, Joachim; Meckl, Heinz; and Busch, Josef, 4,457,495, Cl. 266-170.000.

Klose, George J., to Mattel, Inc. Display for electronic games and the like including a rotating focusing device. 4,457,580, Cl. 350-6.910.
Knabel, Walter, to Marker-Patentverwertungsgesellschaft mbH. Method and apparatus for the actuating behavior of safety ski binding. 4,457,532, Cl. 280-612.000.
Knabel, Walter; and D'Antonio, Nicholas F., to Marker-Patentverwertungsgesellschaft mbH.; and Kinetronic Industries, Inc. Method and apparatus for releasing a ski boot from a ski. 4,458,157, Cl. 307-119.000.
Knierimen, Jeffrey L.; and Fuller, Mark S., to Camco, Incorporated. Shearable no go insert for a well lock. 4,457,368, Cl. 166-217.000.
Knight Engineering & Molding Co.: *See*—
Heinol, Alois R., 4,457,458, Cl. 222-498.000.
Knight, Houston W.: *See*—
Moller, Thomas A.; and Knight, Houston W., 4,457,338, Cl. 137-615.000.
Knight, Lindsay C.; and Compton, Brian, to Australasian Training Aids, Pty. Ltd. Rifle training apparatus. 4,457,715, Cl. 434-22.000.
Knight, Peter D., to Communication and Control Engineering Company Limited. Cam switch mechanism and control device, such as a pullkey, incorporating the same. 4,458,122, Cl. 200-153.0LA.
Knitter, Kathy A.: *See*—
Papalos, John G.; Villa, Jose L.; Knitter, Kathy A.; and Savoly, Arpad, 4,457,762, Cl. 44-51.000.
Knowles, Adrienne, to Comfy Catch-A-Spec Company. Female urine collection device and method. 4,457,314, Cl. 128-760.000.
Ko, Venancio: *See*—
Fay, John A.; Walsh, Cyral M.; and Ko, Venancio, 4,457,323, Cl. 134-18.000.
Kobayashi, Akio: *See*—
Muramatsu, Toshihiko; Kobayashi, Akio; Eino, Tomomi; and Kondo, Toshio, 4,457,282, Cl. 123-486.000.
Kobayashi, Hiroshi, to Nissan Motor Company Limited. Engine intake air flow measuring apparatus. 4,457,166, Cl. 73-118.000.
Kobayashi, Masahiro: *See*—
Yamane, Kazumasa; and Kobayashi, Masahiro, 4,458,060, Cl. 526-292.300.
Kobayashi, Nobuyuki; and Ito, Toshimitsu, to Toyota Jidosha Kabushiki Kaisha. Electronically controlled fuel injection system. 4,457,283, Cl. 123-492.000.
Kobayashi, Tadao: *See*—
Yamanaka, Shigeru; Utagawa, Takashi; and Kobayashi, Tadao, 4,458,016, Cl. 435-85.000.
Koch, Eckhard: *See*—
Vogg, Gunter; Engel, Hinrich; and Koch, Eckhard, 4,457,649, Cl. 410-46.000.
Koch, Klaus, to Hermann Berstorff Maschinenbau GmbH. Extraction device. 4,457,227, Cl. 100-117.000.
Koch, Ronald J.: *See*—
Gruber, Robert J.; Bolte, Steven B.; Grushkin, Bernard; and Koch, Ronald J., 4,457,998, Cl. 430-98.000.
Kodama, Hisashi; Sato, Katsujiro; Tamura, Tetsuomi; Hamamoto, Tooru; and Yamada, Kazuharu, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Hydraulic lifter. 4,457,270, Cl. 123-90.580.
Koehler, Wolfgang; Blocher, Hans-Joachim; and Weiss, Eberhard, to Kernforschungszentrum Karlsruhe. Chassis for a vehicle with variable undercarriage geometry. 4,457,388, Cl. 180-9.480.
Koehn, Richard R.: *See*—
Nash, Richard C.; Hanson, David W.; and Koehn, Richard R., 4,457,682, Cl. 425-219.000.
Koen, Myron J., to Burr-Brown Research Corp. Digitally controlled precision current source with an open loop compensation circuit. 4,458,201, Cl. 323-317.000.
Koga, Ituo, to Toyota Jidosha Kabushiki Kaisha. Flow control device of a helically-shaped intake port. 4,457,272, Cl. 123-188.00M.
Kohsaka, Masanobu: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,458,078, Cl. 548-227.000.
Kohzuma, Chikashi, to Mitsubishi Denki Kabushiki Kaisha. Airconditioner with timer controlled compressor bypass. 4,457,137, Cl. 62-158.000.
Koike, Hirotami; Yanaka, Takashi; and Watanabe, Masaru. Electron microscope of a scanning type. 4,458,151, Cl. 250-310.000.
Koike, Shoichi, to Nissan Motor Company, Limited. Sealing structure for a movable window. 4,457,111, Cl. 49-441.000.
Kokoszka, John J.: *See*—
Battista, Richard A.; Bennett, James G., Jr.; and Kokoszka, John J., 4,458,031, Cl. 502-324.000.
Kokubu, Tadao. Complete antigen drug and a process for producing it for nonspecific allergic disease therapy. 4,457,913, Cl. 424-88.000.
Kolker, Myer: *See*—
Kasevich, Raymond S.; Kolker, Myer; and Dwyer, Arthur S., 4,457,365, Cl. 166-60.000.
Kolm, Eric A.; and Kolm, Henry H., to Piezo Electric Products, Inc. Piezoelectric relay with tapered magnetic detent. 4,458,171, Cl. 310-330.000.
Kolm, Henry H.: *See*—
Kolm, Eric A.; and Kolm, Henry H., 4,458,171, Cl. 310-330.000.
Koltko, George E.: *See*—
Kosina, Paul C.; and Koltko, George E., 4,457,656, Cl. 414-31.000.
Komatsu, Shinichi: *See*—
Fujita, Tsuyoshi; Komatsu, Shinichi; and Toda, Gyozo, 4,457,950, Cl. 427-43.100.
Komatsuzaki, Hiroshi: *See*—
Sekine, Jiro; Komatsuzaki, Hiroshi; Hara, Hiroshi; and Kameyama, Nobuyuki, 4,457,607, Cl. 354-203.000.
Komine, Isamu: *See*—
Hasebe, Nobuhisa; Kawada, Hiroshi; and Komine, Isamu, 4,457,356, Cl. 164-478.000.
Komine, Yoshiharu; and Sawada, Takao, to Mitsubishi Denki Kabushiki Kaisha. Gas sensing element. 4,458,233, Cl. 338-34.000.
Komiya, Masanobu: *See*—
Hayashi, Hiroshi; and Komiya, Masanobu, 4,457,916, Cl. 424-101.000.
Komori Printing Machinery Co., Ltd.: *See*—
Kawaguchi, Shoichi, 4,457,231, Cl. 101-230.000.
Komoto, Shinzuke; and Haneishi, Yasuyuki, to Asahi Kogaki Kogyo Kabushiki Kaisha. Interchangeable lens with electrical contacts for transmitting data to a camera. 4,457,608, Cl. 354-286.000.
Kondo, Isao; and Nakajima, Yukio, to Olympus Optical Co. Ltd. Camera with electrical shutter. 4,457,601, Cl. 354-418.000.
Kondo, Isao: *See*—
Amaya, Mikio; Kimura, Masatoshi; Kondo, Isao; and Horie, Masakatsu, 4,458,258, Cl. 346-153.100.
Kondo, Toshio: *See*—
Muramatsu, Toshihiko; Kobayashi, Akio; Eino, Tomomi; and Kondo, Toshio, 4,457,282, Cl. 123-486.000.
Konian, Richard R., to International Business Machines Corporation. Large swing driver/receiver circuit. 4,458,159, Cl. 307-270.000.
Konishi, Masayuki: *See*—
Kataoka, Tsunehiko; Nagara, Yoshiaki; Hashimoto, Akira; Konishi, Masayuki; and Ogawa, Koichi, 4,458,018, Cl. 435-218.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Ito, Kenji; Shimba, Satoru; Tsuda, Yasuo; and Sugita, Hiroshi, 4,458,012, Cl. 430-549.000.
Kono, Hisashi O., to Institute of Gas Technology. Apparatus and process for fluidized solids systems. 4,457,896, Cl. 423-659.000.
Konstantinov, Ivan T.; Mednikarov, Borislav D.; Sahatchieva, Maria A.; and Burov, Atanas T., to Zlafop pri Ban. Photographic system and photographic material for use therein. 4,458,008, Cl. 430-302.000.
Kopnitsky, Joseph R., deceased: *See*—
Nathenson, Richard D.; Pipich, Charles W.; and Kopnitsky, Joseph R., deceased, 4,458,166, Cl. 310-71.000.
Kopnitsky, Mary C., executrix: *See*—
Nathenson, Richard D.; Pipich, Charles W.; and Kopnitsky, Joseph R., deceased, 4,458,166, Cl. 310-71.000.
Kopp, Walter; and Saalmueller, Karl-Heinz, to Siemens Aktiengesellschaft. Mixing device for blending a developer consisting of carrier particles and toner. 4,457,613, Cl. 355-3.0DD.
Koppers Company, Inc.: *See*—
Carman, Kenneth K.; and Webb, Stanley G., 4,457,735, Cl. 464-32.000.
Korenberg, Jakob, to York-Shipley, Inc. Fast fluidized bed reactor and method of operating the reactor. 4,457,289, Cl. 122-4.00D.
Korner, Gerhard; and Plettner, Horst, to BBC Brown, Boveri & Company, Limited. High-voltage circuit breaker. 4,458,120, Cl. 200-148.00A.
Kortmann, Wilfried: *See*—
Boehmke, Gunther; Bode, Klaus-Dieter, deceased; and Kortmann, Wilfried, 4,458,080, Cl. 548-354.000.
Kosa, Tadatoshi: *See*—
Kashimoto, Hiroo; Kosa, Tadatoshi; Inoue, Akihiko; Yamamoto, Shigemitu; and Kuroishi, Katuhiko, 4,458,108, Cl. 174-152.00R.
Kosina, Paul C.; and Koltko, George E., to Nolan Systems, Inc. Stack assembling apparatus and technique. 4,457,656, Cl. 414-31.000.
Kosson, Robert: *See*—
Alario, Joseph P.; Kosson, Robert; and Leszak, Edward, 4,457,059, Cl. 29-157.30H.
Kosswig, Kurt: *See*—
Balzer, Dieter; and Kosswig, Kurt, 4,457,373, Cl. 166-274.000.
Kostanecki, Tadeusz: *See*—
Darling, Stewart A.; Kostanecki, Tadeusz; and Soos, George, 4,457,430, Cl. 206-459.000.
Kostiner, Edward. Border printer for photographic prints. 4,457,620, Cl. 355-74.000.
Kotera, Hiroaki: *See*—
Yoshida, Kunio; Kotera, Hiroaki; Tsuda, Yukifumi; Kanno, Yoshimitsu; and Naka, Motohiko, 4,458,265, Cl. 358-80.000.
Kotera, Koichi; and Ohta, Takeo, to Matsushita Electric Industrial Co., Ltd. Method for manufacturing optical memory disc. 4,457,794, Cl. 156-64.000.
Kotilge, Jorg: *See*—
Dietl, Josef; Holm, Claus; Kotilge, Jorg; and Wohlschlager, Michael, 4,457,903, Cl. 423-350.000.
Kovach, Stephen M.: *See*—
Zandona, Oliver J.; Hettinger, William P., Jr.; Kovach, Stephen M.; and Beck, Hubert W., 4,457,833, Cl. 208-120.000.
Kovacik, Ronnie: *See*—
Crawford, William K.; and Kovacik, Ronnie, 4,457,568, Cl. 308-207.00A.
Kovacs, Jenoe: *See*—
Rudolf, Peter; Kovacs, Jenoe; Vaeth, Guenter; and Ohlinger, Manfred, 4,457,982, Cl. 428-403.000.
Koyama, Mototsugu: *See*—
Donomoto, Tadashi; Koyama, Mototsugu; Miyake, Joji; and Fuwa, Yoshio, 4,457,979, Cl. 428-614.000.

Kozuka, Michihiro; and Tonokura, Masayuki, to Tomy Kogyo Co., Inc. Toy vehicle having body capable of vertical movement with respect to chassis. 4,457,099, Cl. 446-437.000.

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Kracke, Alan G.: *See*—
Hennenfent, Douglas J.; Holmstrand, Allan L.; and Kracke, Alan G., 4,457,114, Cl. 51-216.00R.

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Kramer, Rinaldo: *See*—
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Jung, Rolf; and Wienen, Walter, 4,457,505, Cl. 270-30.000.

Kravets, Vladimir G.: *See*—
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Kriege, Edward A.; Marshall, Paul J.; and Tuckett, Robert B., to Engineering Design and Management Inc. Heating and cooling system. 4,457,358, Cl. 165-50.000.

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Hirshfield, Jay L.; and Krishnan, Mahadevan, 4,458,148, Cl. 250-284.000.

Kronschnabel, Hartmut, to Kernforschungsanlage Julich GmbH. Apparatus for grinding off the outer shell of a spherical body. 4,457,064, Cl. 29-564.700.

Krooss, Robert J.; and Demarest, David D. Bottle orientation apparatus. 4,457,421, Cl. 198-396.000.

Kroth, Neil W.; and Nat, Gursharan P. S., to Eaton Corporation. Multicolor illuminated toggle switch. 4,458,124, Cl. 200-311.000.

Krueger, Wallace F. Power-assisted valve, particularly for systems handling viscous materials. 4,457,340, Cl. 137-625.500.

Krugly, Semen I.: *See*—
Nefedov, Anatoly P.; Oberman, Felix M.; Katoshin, Jury G.; Krugly, Semen I.; Maljuzhonok, Gennady P.; and Mikhailov, Jury S., 4,458,202, Cl. 324-204.000.

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Kudo, Tetsuichi: *See*—
Horiba, Tatsuo; Takeuchi, Seizi; Tamura, Kohki; Kawamura, Go; and Kudo, Tetsuichi, 4,457,987, Cl. 429-41.000.

Kukes, Simon G., to Phillips Petroleum Company. Demetallization of hydrocarbon containing feed streams. 4,457,835, Cl. 208-251.00H.

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Kummel, Joachim. Burner for the combustion of powdery fuels. 4,457,695, Cl. 431-168.000.

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Kuno, Osamu; and Takamiya, Tooru, to Sony Corporation. Negative to positive image converting apparatus. 4,458,270, Cl. 358-225.000.

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Suzuki, Hiroo; Kuno, Tadashi; Yoshimura, Yasuo; Okugami, Kiyoshi; Hotta, Hisashi; and Otsuka, Shinya, 4,458,040, Cl. 523-412.000.

Kurahashi, Keizo: *See*—
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Kuraray Chemical Co., Ltd.: *See*—
Ohsaki, Takushi; and Abe, Susumu, 4,458,022, Cl. 502-42.000.

Kuraray Co., Ltd.: *See*—
Fumio, Mori; Yoshiaki, Omura; Takashi, Nishida; and Kazuo, Itoi, 4,458,090, Cl. 560-124.000.

Kurata, Yasuhiro: *See*—
Ogami, Nobutoshi; Takada, Takeshi; Shoda, Mikio; and Kurata, Yasuhiro, 4,457,419, Cl. 198-345.000.

Kurihara, Hitoshi; and Wakazawa, Toru, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Typefont wheel and belt for small printer. 4,457,230, Cl. 101-110.000.

Kurita, Hiroyuki: *See*—
Katayama, Shitomi; Shimabukuro, Hajime; Nomura, Suguru; Kurita, Hiroyuki; and Ohno, Akira, 4,457,587, Cl. 350-288.000.

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Kuroda, Yoshio: *See*—
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Kurz, Wolf-Dieter: *See*—
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Kusanagi, Shigekazu; Akiyama, Shigeo; and Nobutani, Tohru, to Matsushita Electric Works, Ltd. Gas detector. 4,458,242, Cl. 340-634.000.

Kuschel, Konrad; and Wiehl, Alfred, to IFE Gesellschaft m.b.H. Door. 4,457,108, Cl. 49-213.000.

Kutzler, James W. Lashless socket drive. 4,457,416, Cl. 192-44.000.

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Kydd, Paul H., to HRI, Inc. Petroleum hydroconversion using acid precipitation of preasphaltenes in resid recycle. 4,457,830, Cl. 208-50.000.

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Premel, Ulrich; and Thones, Gustav, 4,457,361, Cl. 165-84.000.

LaConti, Anthony B.; Dempsey, Russell M.; and Coker, Thomas G., to General Electric Company. Thermally stabilized reduced platinum oxide electrocatalyst. 4,457,823, Cl. 204-282.000.

LaConti, Anthony B.: *See*—
Dempsey, Russell M.; Fragala, Anthony R.; LaConti, Anthony B.; and Enos, John F., 4,457,824, Cl. 204-290.00F.

Lade, Robert W.: *See*—
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Ladewig, Christopher G.: *See*—
Del Vecchio, Joseph A.; Hunnibell, Kenneth L.; Ladewig, Christopher G.; and Harrison, Mark S., 4,457,402, Cl. 187-12.000.

Laesch, Daniel A. Impoundment and diversion systems for preventing or mitigating flooding. 4,457,646, Cl. 405-52.000.

Lagodka, Manfred: *See*—
Unger, Eberhart; Heitkamp, Herbert; Hessel, Heinz; Plester, Karl-Heinz; and Lagodka, Manfred, 4,457,212, Cl. 92-18.000.

Lahti, Terry L. Lifting apparatus. 4,457,492, Cl. 254-8.00B.

Lakomy, Paul E., to Bendix Corporation, The. Fast sampling phase locked loop frequency synthesizer. 4,458,214, Cl. 331-1.00A.

Lamb, Charles G.; and Porenski, Harry S., to Brown & Williamson Tobacco Corporation. Cigarette filter. 4,457,319, Cl. 131-336.000.

Lamont, Lawrence T., Jr., to Varian Associates, Inc. Sputter target for use in a sputter coating source. 4,457,825, Cl. 204-298.000.

Lander, Lynn H.: *See*—
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Landry, Norman R.; and Yorinks, Leonard H., to RCA Corporation. Dispersion correcting waveguide. 4,458,229, Cl. 333-248.000.

Landt, Madlon C., to Lynn, William E. Wall hanging method and means. 4,457,485, Cl. 248-542.000.

Lane, Charles E., III, to Honeywell Inc. Ink cartridge and a method for making the same. 4,458,257, Cl. 346-141.000.

Lane, L. Jubin, to General Electric Company. Frequency to voltage transducer. 4,458,164, Cl. 307-519.000.

Lange, Frederick F.; and Clarke, David R., to Rockwell International Corporation. Method of strengthening silicon nitride ceramics. 4,457,958, Cl. 427-314.000.
Lange, Lawrence K.: *See—*
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Larkin, William G. Portable shower for van or camper vehicle. 4,457,553, Cl. 296-160.000.
Larson, John: *See—*
McCoskey, J. Marion, 4,458,327, Cl. 364-746.000.
LaSalle Steel Company: *See—*
Wilks, Gerald W., 4,457,789, Cl. 148-134.000.
La Spisa, Ronald J., to Phillips Petroleum Company. Boiler control. 4,457,266, Cl. 122-451.100.
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Laub, Leonard: *See—*
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Lauber, Ernst: *See—*
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Laudt, Jurgen, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Wiring diagram pocket for a switchboard cabinet. 4,457,442, Cl. 220-18.000.
Laurel Bank Machine Co., Ltd.: *See—*
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Laurent, Henry: *See—*
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Lautenschlager, Karl, to Karl Lautenschlager K.G., Mobelbeschlagfabrik. Over-center self-closing hinge having a spring biased cam thruster. 4,457,047, Cl. 16-288.000.
Lauterbach, Heinz; and Widera, Jorg, to Robert Bosch GmbH. Apparatus for measuring the mass of a flowing medium. 4,457,169, Cl. 73-202.000.
Lautzenhiser, Theodore V., to Standard Oil Company. Borehole gradiometer. 4,457,077, Cl. 33-304.000.
Lautzenhiser, Theodore V.; and Wirtz, Jimmy D., to Standard Oil Company. Automated borehole gravity meter system. 4,457,168, Cl. 73-151.000.
Lautzenhiser, Theodore V., to Standard Oil Company. Borehole sonic method for porosity characterization. 4,458,340, Cl. 367-32.000.
La Valle, Thomas A.: *See—*
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Lavallee, Francois A.: *See—*
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Lavine, Daniel J.; and Lavine, Mary A. Retainer apparatus for electric plugs. 4,457,571, Cl. 339-75.00P.
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Layfield, James D.: *See—*
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Leach, Dale H. Hand held data entry unit. 4,458,238, Cl. 340-365.00R.
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Lee, Bowman; and Santilli, Donald S., to Chevron Research Company. Method of zeolitic catalyst manufacture. 4,458,025, Cl. 502-66.000.
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Leiher, Alfred J.; Schmid, Daniel; and Pierce, Myrl D., to Benedetti Corporation. Modular room divider system. 4,457,117, Cl. 52-238.100.
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Lein, Werner, deceased: *See—*
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Leis, Brian N., to Battelle Memorial Institute. Repair method and apparatus. 4,458,125, Cl. 219-10.410.
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Sepulveda, Ralph R.; and Lander, Lynn H., 4,457,857, Cl. 252-174.210.
Levin, Mark, to PPG Industries, Inc. Electrolytic cell, permionic membrane, and method of electrolysis. 4,457,815, Cl. 204-98.000.
Lewis, Edward L.; Beasley, Robin D.; and Morgon, Trevor A., to Elliott Brothers (London) Limited. Fibre optic terminals for use with bidirectional optical fibres. 4,457,582, Cl. 350-96.200.
Lewis, Irwin C., to Union Carbide Corporation. Mesophase pitch having ellipsoidal molecules and method for making the pitch. 4,457,828, Cl. 585-11.000.
Liaw, Soonchin; and Spector, George. Gluten maker for the home. 4,457,629, Cl. 366-139.000.
Liekens, Wilfried F.: *See—*
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Light, David N.: *See—*
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Light, Gerard M., to Eaton Corporation. Torque responsive fluid coupling device. 4,457,417, Cl. 192-58.00B.
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Lipstep Design Group Corp.: *See—*
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Lofquist, Robert A.; Twilley, Ian C.; and Saunders, Peter R., to Allied Corporation. Nylon comfort fiber containing poly(N,N-dimethylacrylamide). 4,458,053, Cl. 525-183.000.
Loix, Gilbert. Elements to be assembled to form temporary stair. 4,457,398, Cl. 182-151.000.
Lorenc, Walter F.; Kelly, John A.; and Mandel, Frederick S., to Nalco Chemical Company. Carboxylate polymers for internal scale control agents in boiler systems. 4,457,847, Cl. 210-698.000.
Loughridge, Frederick A.: *See—*
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Love, James P.; and Rafique, Syed O. Z. M. Fluid gasification apparatus. 4,457,877, Cl. 261-64.00B.

Lowery, A. J. Utility cart. 4,457,527, Cl. 280-47.190.
Lowery, John. Bag mouth holder. 4,457,549, Cl. 294-55.000.
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Lyasko, Arie, to Haramco Research, Inc. Parametric antenna. 4,458,248, Cl. 343-719.000.
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Veale, John R., 4,458,322, Cl. 364-571.000.
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Gruner, Hans; Schrewe, Hans; Pleschiutschnigg, Fritz-Peter; and Parschat, Lothar, 4,458,155, Cl. 250-572.000.
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Heiman, Frederic P., 4,458,187, Cl. 318-490.000.
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McClean, John W., to Breville Holdings Pty., Limited. Electrically heated cooking utensil. 4,458,139, Cl. 219-433.000.
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McDonough, Paul F. Modular wheel supported billboard panels with locking wedges. 4,457,090, Cl. 40-624.000.
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McSpadden, John T., to Inventive Technology International. Dental instrument. 4,457,710, Cl. 433-81.000.
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Sekiyama, Kenichi; Mishima, Yasuhiro; Hiraiwa, Hisao; and Segawa, Joichiro, 4,457,547, Cl. 293-110.000.
Mita Industrial Co., Ltd.: *See*—
Nakajima, Tadanobu; Iseki, Masahide; and Yoshiyama, Toshio, 4,457,614, Cl. 355-3.00R.
Mitchell, Sharon J.; and Spinner, Jonathon, to Procter & Gamble Company, The. Liquid detergent composition contains abrasive particles, anionic and nonionic surfactants. 4,457,856, Cl. 252-166.000.
Mitsubishi Chemical Industries, Ltd.: *See*—
Otani, Sugio; Yanagisawa, Sadakatsu; and Niijima, Kunio, 4,457,984, Cl. 428-220.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Chitose, Takashi; and Ina, Teruo, 4,457,792, Cl. 156-56.000.
Kohzuma, Chikashi, 4,457,137, Cl. 62-158.000.
Komine, Yoshiharu; and Sawada, Takao, 4,458,233, Cl. 338-34.000.
Ogura, Masato; and Horio, Noriyasu, 4,457,672, Cl. 417-360.000.
Ohba, Koichi, 4,457,154, Cl. 72-234.000.
Takawashi, Tamio; Sakakibara, Toshimitsu; and Yamada, Shigeo, 4,458,190, Cl. 318-603.000.
Ueda, Tadakazu; and Tutumi, Kazumichi, 4,457,276, Cl. 123-339.000.
Ueyama, Yoshiji; and Asayama, Yoshiaki, 4,457,281, Cl. 123-482.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Hiramatsu, Takeo, 4,457,411, Cl. 192-0.076.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Hoshino, Yoseaku; and Niwa, Toshikazu, 4,457,332, Cl. 137-334.000.
Watanabe, Akira, 4,457,659, Cl. 414-223.000.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Oshima, Masanao; and Tabuchi, Hiroshi, 4,457,250, Cl. 114-265.000.
Mitsuyu, Tsuneo; Maeda, Hisamitsu; and Wasa, Kiyotaka, to Matsushita Electric Industrial Co., Ltd. Pickup stylus. 4,458,346, Cl. 369-126.000.
Mitzlaff, James E.: *See*—
Miller, Gene D.; Mitzlaff, James E.; and Kwitkowski, Peter A., 4,458,209, Cl. 330-141.000.
Miura, Ken: *See*—
Watanabe, Hiroyuki; Tanaka, Yasushi; and Miura, Ken, 4,457,538, Cl. 280-801.000.
Miyake, Joji: *See*—
Donomoto, Tadashi; Koyama, Mototsugu; Miyake, Joji; and Fuwa, Yoshio, 4,457,979, Cl. 428-614.000.
Miyamoto, Kazuaki: *See*—
Nishizaki, Tomoyoshi; Miyamoto, Minoru; Miyamoto, Kazuaki; Yoshida, Ken; Yamaji, Kathuhiko; and Nakata, Yasushi, 4,457,136, Cl. 62-48.000.
Miyamoto, Minoru: *See*—
Nishizaki, Tomoyoshi; Miyamoto, Minoru; Miyamoto, Kazuaki; Yoshida, Ken; Yamaji, Kathuhiko; and Nakata, Yasushi, 4,457,136, Cl. 62-48.000.
Miyamoto, Yasuhiko, to Fuji Jukogyo Kabushiki Kaisha. Apparatus for driving a surfboard. 4,457,724, Cl. 440-38.000.
Miyashita, Hideo, to Fujitsu Fanuc Limited. Circuit for controlling a D.C. electromagnetic brake. 4,458,290, Cl. 361-152.000.
Miyashita, Hideo: *See*—
Inaba, Hajimu; Miyashita, Hideo; and Otsuka, Shoichi, 4,458,188, Cl. 318-568.000.
Miyata, Shigeo: *See*—
Manabe, Tadashi; and Miyata, Shigeo, 4,458,030, Cl. 502-183.000.
Mizokami, Kazunori, to Olympus Optical Company Ltd. Multiple light emission control system utilizing electronic flashes. 4,457,602, Cl. 354-416.000.
Mobil Oil Corporation: *See*—
Braid, Milton, 4,457,868, Cl. 260-404.000.
Chung, Harold S.; and Dickert, Joseph J., Jr., 4,457,827, Cl. 208-11.0LE.
Grotyohann, Richard G.; Johnston, Byron E.; and Schlinger, Robin, 4,457,899, Cl. 423-321.00S.
Huang, Yun-Yang; and Rosinski, Edward J., 4,457,685, Cl. 425-461.000.
Hungerford, Gordon P., 4,457,254, Cl. 118-34.000.
Oleck, Stephen M.; and Wilson, Robert C., Jr., 4,458,024, Cl. 502-66.000.
Schmitt, Kirk D., 4,458,048, Cl. 524-557.000.
Schmitt, Kirk D., 4,458,052, Cl. 525-61.000.
Yan, Tsoung-Yuan; and Shu, Paul, 4,458,033, Cl. 521-26.000.
Moen, Alfred M., to Stanadyne, Inc. High rise kitchen spout. 4,457,342, Cl. 137-801.000.
Mohr, Dieter; Herwig, Walter; Frass, Werner; and Usbeck, Gerhard, to Hoechst Aktiengesellschaft. Polyvinylmethylphosphinic acid, process for its manufacture and use. 4,458,005, Cl. 430-271.000.
Mohsin, Mohammed E., to National Research Development Corporation. Bearings. 4,457,566, Cl. 308-5.00R.
Moller, Bo: *See*—
Vogl, Georg; Moller, Bo; Pettersson, Erland; and Johansson, Arnold, 4,458,147, Cl. 250-233.000.
Moller, Thomas A.; and Knight, Houston W., to FMC Corporation. Telescoping boom supported flip-flop service line. 4,457,338, Cl. 137-615.000.
Molnar, Hugo; and Robbins, David L., to Minnesota Mining and Manufacturing Company. Self-regulating infant ventilator. 4,457,304, Cl. 128-204.250.

Molteno, Anthony C. B. Device for draining aqueous humour. 4,457,757, Cl. 604-294.000.
Momiyama, Kikuo: *See—*
Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; Sakai, Shinji; Uchiyama, Takashi; and Momiyama, Kikuo, 4,457,612, Cl. 354-471.000.
Monarch Marking Systems, Inc.: *See—*
Hamisch, Paul H., Jr., 4,457,539, Cl. 283-81.000.
Jenkins, William A., 4,457,981, Cl. 428-41.000.
Monbaliu, Marcel J.: *See—*
Van de Sande, Christian C.; Vandewalle, Jan J.; Monbaliu, Marcel J.; and Van Poucke, Raphael K., 4,458,011, Cl. 430-543.000.
Monette, Serge: *See—*
Stanley, Robert W.; Monette, Serge; and Harris, Bryn, 4,457,897, Cl. 423-141.000.
Monick, Frederick R.; and Muster, Stanley J., to Eaton Corporation. Automatic slack adjuster. 4,457,407, Cl. 188-71.900.
Monsanto Company: *See—*
Ebner, Jerry R., 4,457,905, Cl. 423-376.000.
Gambell, James W.; and Auvil, Steven R., 4,457,904, Cl. 423-376.000.
Howse, Paul T., Jr.; Beasley, Byron E.; Jacques, M. Allan; and Snooks, Rupert J., Jr., 4,457,883, Cl. 264-168.000.
Rogers, Thomas E.; Jansson, Robert E.; and Baizer, Manuel M., 4,457,813, Cl. 204-74.000.
Monsay, Evelyn H.: *See—*
Tehon, Stephen W.; and Monsay, Evelyn H., 4,458,343, Cl. 367-149.000.
Montalvo, William W., III. Spring actuated disc brake assembly with cam structure for force multiplication effect. 4,457,408, Cl. 188-72.200.
Montefluos S.p.A.: *See—*
Marraccini, Antonio; Pieroni, Marcello; Pasquale, Antonio; and Balducci, Luigi, 4,458,073, Cl. 546-14.000.
Monti, Alberto, to Olivetti Tecnost, S.p.A. Method and device for testing units for processing magnetic disks. 4,458,275, Cl. 360-78.000.
Moon, William G.: *See—*
Carr, Norman L.; Prudich, Michael E.; King, William E., Jr.; and Moon, William G., 4,457,826, Cl. 208-8.0LE.
Moore, Charles E. Holding device for a dental dowel pin. 4,457,709, Cl. 433-74.000.
Moore, Duncan T., to Corning Glass Works. Spherical gradient-index lens designs for video-disk pickup lens or the like. 4,457,590, Cl. 350-413.000.
Moore, John W., to Swan Corporation, The. Modular pre-plumbed shower unit. 4,457,031, Cl. 4-614.000.
Moorman, David S.: *See—*
Kinder, Mark R.; and Moorman, David S., 4,457,678, Cl. 418-61.00B.
Moormann, Hans: *See—*
Giebel, Burkhard; Moormann, Hans; and Schrader, Lothar, 4,458,338, Cl. 365-201.000.
Morgan, David L., to Seymour-Sheridan, Inc. Bellows structure and method. 4,457,213, Cl. 92-42.000.
Morgan, John W., II: *See—*
Finke, Harry P.; Morgan, John W., II; and Poe, Lee G., 4,457,706, Cl. 432-226.000.
Morgon, Trevor A.: *See—*
Lewis, Edward L.; Beasley, Robin D.; and Morgon, Trevor A., 4,457,582, Cl. 350-96.200.
Morgun, Vasily M.: *See—*
Akhmadiev, Galimzyan M.; Buvailo, Ilya A.; Morgun, Vasily M.; Mutin, Felix I.; and Yastrebov, Petr I., 4,457,236, Cl. 104-138.00G.
Morihashi, Toshifumi: *See—*
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; Noda, Koshi; and Morihashi, Toshifumi, 4,457,130, Cl. 57-328.000.
Morii, Hiroshi: *See—*
Ishii, Hiroshi; Morii, Hiroshi; and Ishijima, Saburo, 4,457,488, Cl. 251-133.000.
Morimoto, Yoshiro: *See—*
Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, 4,457,410, Cl. 192-0.052.
Morinaga, Tsuyoshi: *See—*
Kawai, Kimitoshi; Sugawara, Kunio; and Morinaga, Tsuyoshi, 4,457,863, Cl. 260-112.00R.
Morishita, Hirosada: *See—*
Kawamoto, Mineo; Murakami, Kanji; Itoh, Yutaka; Matsuda, Youichi; Wajima, Motoyo; Morishita, Hirosada; Kawakubo, Shoji; and Yoshimura, Toyofusa, 4,457,952, Cl. 427-98.000.
Morita, Ken: *See—*
Hashimoto, Tadashi; and Morita, Ken, 4,458,119, Cl. 200-145.000.
Moriya, Shigeru: *See—*
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Moriya, Yoshiaki: *See—*
Suzuki, Seigo; Eguchi, Seiji; and Moriya, Yoshiaki, 4,458,313, Cl. 364-200.000.
Morley, James P., to CR Industries. Reinforced track pin assemblies and seals therefor. 4,457,521, Cl. 277-92.000.
Morris, Henrietta K., to Surgikos, Inc. Surgical head drape. 4,457,026, Cl. 2-171.000.
Mosaic Systems, Inc.: *See—*
Stopper, Herbert; and Flasck, Richard A., 4,458,297, Cl. 361-403.000.
Mostek Corporation: *See—*
Brehmer, Kevin E.; and Fisher, John A., 4,458,212, Cl. 330-260.000.
Motley, David M.; and Salman, Naif D., to Hycom Incorporated. Adaptive phase lock loop. 4,458,355, Cl. 375-82.000.
Motola, Patrick D.: *See—*
Amezcua, Robert; Clements, Silous F.; Dachowski, Richard P.; and Motola, Patrick D., 4,458,331, Cl. 364-900.000.
Clements, Silous F.; Motola, Patrick D.; Simpson, Richard O.; and Swift, Shirley F., 4,458,311, Cl. 364-200.000.
Motornetics Corporation: *See—*
Welburn, Ross D., 4,458,168, Cl. 310-185.000.
Motorola, Inc.: *See—*
Dellande, Brian W.; and Wurzburg, Henry, 4,458,206, Cl. 329-50.000.
Miller, Gene D.; Mitzlaff, James E.; and Kwitkowski, Peter A., 4,458,209, Cl. 330-141.000.
Tenney, David L.; Krause, James; and Welk, John R., 4,458,178, Cl. 315-8.000.
Mottla, Gilbert E. Collapsible/knockdown sawbuck. 4,457,504, Cl. 269-296.000.
Moustakakis, Bill: *See—*
DiNicolantonio, Arthur R.; and Moustakakis, Bill, 4,457,364, Cl. 165-134.00R.
Mozer, Forrest S. Storage element for speech synthesizer. 4,458,110, Cl. 381-32.000.
Mroz, Edward; and Wesenduk, Richard J., to Data Electronics, Inc. Tape cartridge housing. 4,457,473, Cl. 242-192.000.
Mrozik, Helmut H., to Merck & Co., Inc. 4a-Substituted avermectin compounds. 4,457,920, Cl. 424-180.000.
MTD Products Inc.: *See—*
Hauser, Hans, 4,457,188, Cl. 74-473.00P.
MTS Systems Corporation: *See—*
Andersen, Dennis H., 4,457,072, Cl. 33-143.00L.
Dollerschell, John O., 4,458,189, Cl. 318-591.000.
Gram, Martin M., 4,457,684, Cl. 425-451.900.
MTU Motoren-und Turbinen-Union Friedrichshafen GmbH: *See—*
Deutschmann, Herbert, 4,457,134, Cl. 60-612.000.
Muchowski, Joseph M.; and Greenhouse, Robert, to Syntex (U.S.A.) Inc. 5-Aroyl 1,2-dihydro-3H-pyrrolo[1,2-a]pyrrole-1,1-decarboxylates. 4,458,081, Cl. 548-453.000.
Mueller, Martin: *See—*
Mueller, Martin J.; and Mueller, Martin, 4,457,348, Cl. 141-1.000.
Mueller, Martin J.; and Mueller, Martin. Food product fill pump. 4,457,348, Cl. 141-1.000.
Mueller-Schloer, Christian, to Siemens Corporation. Method and apparatus providing registered mail features in an electronic communication system. 4,458,109, Cl. 178-22.110.
Muga, M. Luis, to Muga, Patrick Luis. Time-of-flight mass spectrometer. 4,458,149, Cl. 250-287.000.
Muga, Patrick Luis: *See—*
Muga, M. Luis, 4,458,149, Cl. 250-287.000.
Mui, Paul K.; Smith, James H.; Woodard, Charles C.; and Albrecht, Laurence J., to Hewlett-Packard Company. Media module. 4,458,282, Cl. 360-133.000.
Muklevicz, Joseph A.: *See—*
Foster, Gordon T.; and Muklevicz, Joseph A., 4,457,730, Cl. 441-94.000.
Muller, Hans-Jurgen: *See—*
Habel, Georg; Heidemanns, Rolf-Peter; and Muller, Hans-Jurgen, 4,457,278, Cl. 123-438.000.
Muller, Norbert: *See—*
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Multiform Desiccants, Inc.: *See—*
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., 4,457,843, Cl. 210-282.000.
Multuloc Corporation: *See—*
Grearson, Kenneth R.; and Watson, Robert, Jr., 4,457,115, Cl. 52-73.000.
Munch, Joseph, to Thomson-CSF. Coupling device for coupling a rontgen tube-holder to the frame of an image receiver in a tomograph. 4,458,354, Cl. 378-25.000.
Munk, Kurt, to Ciba-Geigy Corporation. Pourable solid mixtures. 4,458,029, Cl. 502-171.000.
Munk, Kurt, to Ciba-Geigy Corporation. Pourable solid mixture. 4,458,051, Cl. 524-779.000.
Munk, Miner N., to Milton Roy Company. Liquid chromatography methods and devices. 4,457,846, Cl. 210-656.000.
Murakami, Hiroyasu: *See—*
Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; Sakai, Shinji; Uchiyama, Takashi; and Momiyama, Kikuo, 4,457,612, Cl. 354-471.000.
Murakami, Kanji: *See—*
Kawamoto, Mineo; Murakami, Kanji; Itoh, Yutaka; Matsuda, Youichi; Wajima, Motoyo; Morishita, Hirosada; Kawakubo, Shoji; and Yoshimura, Toyofusa, 4,457,952, Cl. 427-98.000.
Murakami, Reiji; Hashimoto, Shinichi; and Tamura, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Developing device. 4,457,257, Cl. 118-652.000.
Muramatsu, Toshihiko; Kobayashi, Akio; Eino, Tomomi; and Kondo, Toshio, to Nippondenso Co., Ltd. Electronic control for fuel injection. 4,457,282, Cl. 123-486.000.
Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; Tomioka, Kenichi; and Numasaki, Yoso, to Yamanouchi Pharmaceutical Co. 2-Hydroxyoxanilic acid derivatives. 4,457,872, Cl. 260-465.00D.
Murata Kikai Kabushiki Kaisha: *See—*
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; Noda, Koshi; and Morihashi, Toshifumi, 4,457,130, Cl. 57-328.000.

Murata Manufacturing Co., Ltd.: *See*—
Matsuda, Hisashi, 4,458,150, Cl. 250-298.000.
Murata, Yoichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method and an apparatus for measuring wheel alignment of motor vehicles. 4,457,075, Cl. 33-203.150.
Muryoi, Takeshi; and Imanari, Hitoshi, to Nippon Kogaku K.K. Single operator macro-focusing zoom lens barrel. 4,457,591, Cl. 350-430.000.
Muslin, Bernard J.: *See*—
Snow, Thomas M.; and Muslin, Bernard J., 4,457,544, Cl. 285-251.000.
Muster, Stanley J.: *See*—
Monick, Frederick R.; and Muster, Stanley J., 4,457,407, Cl. 188-71.900.
Mutin, Felix I.: *See*—
Akhmadiev, Galimzyan M.; Buvailo, Ilya A.; Morgun, Vasily M.; Mutin, Felix I.; and Yastrebov, Petr I., 4,457,236, Cl. 104-138.00G.
N. V. Klippan S.A.: *See*—
Weman, Per O.; and Neumann, Fred F., 4,457,251, Cl. 116-212.000.
Nabisco Brands, Inc.: *See*—
Horwath, Robert O.; and Irbe, Robert M., 4,458,017, Cl. 435-94.000.
Stroz, John J.; and Mackay, Donald A. M., 4,457,921, Cl. 424-180.000.
Nachshol Electronics Ltd.: *See*—
Gitlis, Meir, 4,458,143, Cl. 235-449.000.
Nagai, Akio, to Epson Corporation. Motor control for printer carriage. 4,457,639, Cl. 400-322.000.
Nagara, Yoshiaki: *See*—
Kataoka, Tsunehiko; Nagara, Yoshiaki; Hashimoto, Akira; Konishi, Masayuki; and Ogawa, Koichi, 4,458,018, Cl. 435-218.000.
Nagashima, Mamoru, to Nissan Motor Co., Ltd. Weft inserting nozzle of an air-jet type weaving loom. 4,457,346, Cl. 139-435.000.
Nagl, Martin, to Voest-Alpine Aktiengesellschaft. Apparatus for delivering a stream of green pellets. 4,457,840, Cl. 209-257.000.
Nagubandi, Sreeramulu, to Stauffer Chemical Company. Process for preparing phosphonomethylated amino acids. 4,457,873, Cl. 260-502.50F.
Naito, Hiroshi: *See*—
Matsui, Masao; Naito, Hiroshi; and Okamoto, Karuo, 4,457,973, Cl. 428-372.000.
Naito, Takayuki: *See*—
Kamachi, Hajime; Okumura, Jun; and Naito, Takayuki, 4,457,929, Cl. 424-246.000.
Naka, Motohiko: *See*—
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Nakagaki, Hiroshi: *See*—
Maeda, Yasunori; and Nakagaki, Hiroshi, 4,457,694, Cl. 431-90.000.
Nakagawa, Yasuhiko: *See*—
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Nakaguchi, Osamu: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,458,078, Cl. 548-227.000.
Nakai, Meroji: *See*—
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Nakajima, Tadanobu; Iseki, Masahide; and Yoshiyama, Toshio, to Mita Industrial Co., Ltd. Electrostatic copying apparatus. 4,457,614, Cl. 355-3.00R.
Nakajima, Yukio: *See*—
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Nakamori, Hiromichi: *See*—
Imamura, Yoshinobu; Ito, Hajime; Sato, Yoko; and Nakamori, Hiromichi, 4,457,945, Cl. 426-53.000.
Nakanishi, Susumu, to Pfizer Inc. Process for the manufacture of crystalline sodium cefoperazone. 4,458,070, Cl. 544-27.000.
Nakanishi, Yukinaga: *See*—
Kirino, Hisao; Yabumoto, Yukinobu; Iritani, Takashi; Suga, Masao; Nakanishi, Yukinaga; and Itoh, Masaru, 4,457,819, Cl. 204-181.00R.
Nakano, Takao: *See*—
Irie, Shin-ichi; Yamashita, Yasuhiro; Nakano, Takao; and Tanabe, Teruyoshi, 4,458,103, Cl. 174-73.00R.
Nakashima, Hiroyuki; Sumida, Morihiro; and Goto, Hiroki, to Nippon Steel Corporation. Steelmaking process with separate refining steps. 4,457,778, Cl. 75-51.000.
Nakata, Shinichi; Takahashi, Hiroshi; Matsuyama, Shigeru; and Hirano, Reiji, to Canon Kabushiki Kaisha. Calculator capable of calculating with additional externally instructed units. 4,458,325, Cl. 364-705.000.
Nakata, Yasushi: *See*—
Nishizaki, Tomoyoshi; Miyamoto, Minoru; Miyamoto, Kazuaki; Yoshida, Ken; Yamaji, Kathuhiko; and Nakata, Yasushi, 4,457,136, Cl. 62-48.000.
Nakazawa, Hidezi; and Hatakeyama, Yoshiharu, to Yoshida Industry Co., Ltd. Pearly-lustered container. 4,457,961, Cl. 428-35.000.
Nalco Chemical Company: *See*—
Lorenc, Walter F.; Kelly, John A.; and Mandel, Frederick S., 4,457,847, Cl. 210-698.000.
Nanba, Taro, to Yugenkaisha Nakaya Nokogirikikai Seisakusho. Method and apparatus for profile-forming saw teeth. 4,457,190, Cl. 76-43.000.
Nash, Richard C.; Hanson, David W.; and Koehn, Richard R., to Fabcon, Inc. Machine for casting concrete members. 4,457,682, Cl. 425-219.000.
Nat, Gursharan P. S.: *See*—
Kroth, Neil W.; and Nat, Gursharan P. S., 4,458,124, Cl. 200-311.000.
Nathenson, Richard D.; Pipich, Charles W.; and Kopnitsky, Joseph R., deceased (by Kopnitsky, Mary C., executrix), to Westinghouse Electric Corp. Dynamoelectric machine with a salient pole rotor. 4,458,166, Cl. 310-71.000.
National Nuclear Corporation: *See*—
Scott, Donald, 4,457,890, Cl. 376-362.000.
National Research Development Corporation: *See*—
Dabill, David W.; Gentry, Stephen J.; Hurst, Nicholas W.; Jones, Alan; and Walsh, Peter T., 4,457,954, Cl. 427-125.000.
Jones, Robert L.; and Wilson, Norman H., 4,458,091, Cl. 562-502.000.
Mohsin, Mohammed E., 4,457,566, Cl. 308-5.00R.
National Steel Corporation: *See*—
Saunders, William T.; Austin, Lowell W.; Smith, John R.; and Bingle, William D., 4,457,150, Cl. 72-47.000.
Smith, John R.; Bingle, William D.; and Austin, Lowell W., 4,457,450, Cl. 220-455.000.
Nauflett, George W.: *See*—
Gill, Robert C.; and Nauflett, George W., 4,457,791, Cl. 149-19.300.
Needham, Barbara, to ITT Industries. Permanently connecting a set of conductive tracks on a substrate with a co-operating set on a printed circuit. 4,457,796, Cl. 156-182.000.
Neefe, Charles W. Method of making contact lens blanks. 4,457,880, Cl. 264-1.400.
Nefedov, Anatoly P.; Oberman, Felix M.; Katoshin, Jury G.; Krugly, Semen I.; Maljuzhonok, Gennady P.; and Mikhailov, Jury S., to Institut Vysokikh Temperatur Akademii Nauk SSSR. Device for measuring local electric conductivity of low-temperature plasma. 4,458,202, Cl. 324-204.000.
Nefedov, Viktor A.: *See*—
Ivaschenko, Alexandr V.; Lazareva, Valentina T.; Prudnikova, Elena K.; Rumyantsev, Vladimir G.; Pljusnina, Tamara S.; Nefedov, Viktor A.; Blinov, Lev M.; Titov, Viktor V.; Sevostyanov, Vladimir P.; and Shoshin, Vadim M., 4,457,859, Cl. 252-299.610.
Neilson, James M. M., to University of Edinburgh, The University Court of the. DC Motor control. 4,458,183, Cl. 318-139.000.
Nelander, Nils A.: *See*—
Andersson, Sten E. O.; and Nelander, Nils A., 4,457,337, Cl. 137-614.130.
Nelson, Gary J.: *See*—
Scheurich, John L.; and Nelson, Gary J., 4,457,209, Cl. 89-45.000.
Nelson, Peter S.: *See*—
Chapman, John L., Jr.; La Valle, Thomas A.; and Nelson, Peter S., 4,458,288, Cl. 361-124.000.
Nelving, Hans G.: *See*—
Almstrom, Sten-Hakan; and Nelving, Hans G., 4,457,133, Cl. 60-524.000.
Neumann, Fred F.: *See*—
Weman, Per O.; and Neumann, Fred F., 4,457,251, Cl. 116-212.000.
New Nippon Electric Co., Ltd.: *See*—
Katayama, Hiroomi; Fujii, Masahiko; and Hirosawa, Yoshiaki, 4,457,286, Cl. 123-612.000.
Newport Pharmaceutical International, Inc.: *See*—
Simon, Lionel N.; Giner-Sorolla, Alfredo; and Guttag, Alvin, 4,457,919, Cl. 424-180.000.
Newsome, David L., to American Can Company. Polymeric and film structure for use in shrink bags. 4,457,960, Cl. 428-35.000.
Newton, Christopher: *See*—
Hamilton, Alexander; MacLennan, Alexander H.; and Newton, Christopher, 4,457,783, Cl. 106-288.00Q.
Nezu, Toshikazu: *See*—
Tanabe, Kenzo; and Nezu, Toshikazu, 4,458,361, Cl. 381-15.000.
NHK Spring Co., Ltd.: *See*—
Katayama, Shitomi; Shimabukuro, Hajime; Nomura, Suguru; Kurita, Hiroyuki; and Ohno, Akira, 4,457,587, Cl. 350-288.000.
Kato, Michio; Takahashi, Hayao; and Hoshino, Hidekazu, 4,457,622, Cl. 356-237.000.
Ojima, Juji, 4,457,497, Cl. 267-9.00R.
Shimabukuro, Hajime; Watanabe, Shuichi; Katayama, Shitomi; and Ohno, Akira, 4,457,598, Cl. 350-288.000.
Niagara Lockport Industries, Inc.: *See*—
Harvey, Roger J., 4,457,968, Cl. 428-229.000.
Nibco Inc.: *See*—
Shaefer, Robert R.; and Matthews, Kenneth J., 4,457,542, Cl. 285-55.000.
Nicholas, John D.: *See*—
Trieste, Mario; and Nicholas, John D., 4,457,522, Cl. 277-205.000.
Nickisch, Klaus: *See*—
Bittler, Dieter; Laurent, Henry; Nickisch, Klaus; and Wiechert, Rudolf, 4,457,925, Cl. 424-243.000.
Nieuwhof, Arjen: *See*—
Van't Sant, Jan P.; and Nieuwhof, Arjen, 4,457,776, Cl. 75-6.000.
Nightingale, Christopher C. Figure kicking toy. 4,457,100, Cl. 446-333.000.
Niijima, Kunio: *See*—
Otani, Sugio; Yanagisawa, Sadakatsu; and Niijima, Kunio, 4,457,984, Cl. 428-220.000.
Nippon Densan Corp.: *See*—
Kawate, Yousuke, 4,458,184, Cl. 318-254.000.

Nippon Electric Co., Ltd.: *See*—
Matsumura, Eiichi, 4,458,286, Cl. 361-91.000.
Nippon Kogaku K.K.: *See*—
Ishizuki, Kenji; Watanabe, Sakuji; and Daitoku, Koichi, 4,457,606, Cl. 354-173.110.
Muryoi, Takeshi; and Imanari, Hitoshi, 4,457,591, Cl. 350-430.000.
Tomino, Naoki; Kimura, Makoto; Magariyama, Kenichi; and Shiokama, Yoshiharu, 4,457,609, Cl. 354-286.000.
Wakamiya, Koichi, 4,457,596, Cl. 350-472.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Hasebe, Nobuhisa; Kawada, Hiroshi; and Komine, Isamu, 4,457,356, Cl. 164-478.000.
Nippon Light Metal Company Ltd.: *See*—
Kirino, Hisao; Yabumoto, Yukinobu; Iritani, Takashi; Suga, Masao; Nakanishi, Yukinaga; and Itoh, Masaru, 4,457,819, Cl. 204-181.00R.
Nippon Paint Co., Ltd.: *See*—
Kirino, Hisao; Yabumoto, Yukinobu; Iritani, Takashi; Suga, Masao; Nakanishi, Yukinaga; and Itoh, Masaru, 4,457,819, Cl. 204-181.00R.
Nippon Steel Corporation: *See*—
Nakashima, Hiroyuki; Sumida, Morihiro; and Goto, Hiroki, 4,457,778, Cl. 75-51.000.
Nippon Telegraph & Telephone Public Corp.: *See*—
Omura, Yasuhisa, 4,458,261, Cl. 357-23.700.
Nippondenso Co., Ltd.: *See*—
Hattori, Yoshiyuki; Matsui, Kazuma; and Kinbara, Hiroji, 4,457,742, Cl. 474-201.000.
Muramatsu, Toshihiko; Kobayashi, Akio; Eino, Tomomi; and Kondo, Toshio, 4,457,282, Cl. 123-486.000.
Nishi, Masataka: *See*—
Ando, Toshinari; Nishi, Masataka; Takahashi, Yoshikazu; and Shimamoto, Susumu, 4,458,106, Cl. 174-126.00S.
Nishikawa, Masaji, to Olympus Optical Company Limited. Electrophotographic process of retention type. 4,457,993, Cl. 430-54.000.
Nishimura, Katsuji: *See*—
Horigome, Koichi; Okada, Seizo; Nishimura, Katsuji; and Yamamoto, Hachizou, 4,458,317, Cl. 364-406.000.
Nishimura, Kotaro: *See*—
Fukuda, Minoru; Yamatani, Shigeru; Nishimura, Kotaro; and Endo, Akira, 4,458,348, Cl. 365-185.000.
Nishimura, Yukuo: *See*—
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,458,256, Cl. 346-140.00R.
Nishizaki, Tomoyoshi; Miyamoto, Minoru; Miyamoto, Kazuaki; Yoshida, Ken; Yamaji, Kathuhiko; and Nakata, Yasushi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Metal hydride reactor. 4,457,136, Cl. 62-48.000.
Nissan Motor Company, Limited: *See*—
Fukushima, Naoto; Iwata, Kazuroh; and Hidaka, Kunihiko, 4,457,409, Cl. 188-282.000.
Hamai, Kyugo; Nakagawa, Yasuhiko; Nakai, Meroji; Furukawa, Junichi; and Ishizuka, Takashi, 4,457,285, Cl. 123-598.000.
Kobayashi, Hiroshi, 4,457,166, Cl. 73-118.000.
Koike, Shoichi, 4,457,111, Cl. 49-441.000.
Nagashima, Mamoru, 4,457,346, Cl. 139-435.000.
Suga, Masaaki; Morimoto, Yoshiro; Hamada, Hideo; Futagi, Masaaki; and Suzuki, Tadashi, 4,457,410, Cl. 192-0.052.
Suzuki, Kunihiko, 4,457,394, Cl. 180-247.000.
Yoshioka, Hachiro, 4,457,141, Cl. 60-299.000.
Niwa, Katsumi. Cable clamp. 4,457,053, Cl. 24-304.000.
Niwa, Toshikazu: *See*—
Hoshino, Yonesaku; and Niwa, Toshikazu, 4,457,332, Cl. 137-334.000.
Noble, Gerald: *See*—
Mason, Joe; Noble, Gerald; Eckert, Hermann; and Tissing, Steven, 4,457,795, Cl. 156-73.500.
Noble, Roger K.: *See*—
Schwartz, Robert E.; Noble, Roger K.; and Keller, Michael R., 4,457,696, Cl. 431-202.000.
Nobutani, Tohru: *See*—
Kusanagi, Shigekazu; Akiyama, Shigeo; and Nobutani, Tohru, 4,458,242, Cl. 340-634.000.
Nobutoki, Saburo; Ichikawa, Mitsuo; and Sawaguchi, Takeo, to Hitachi, Ltd. Method of fabricating image pickup tubes. 4,457,732, Cl. 445-35.000.
Noda, Koshi: *See*—
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; Noda, Koshi; and Morihashi, Toshifumi, 4,457,130, Cl. 57-328.000.
Noda, Noriyuki: *See*—
Tabaru, Kazunori; and Noda, Noriyuki, 4,457,851, Cl. 252-62.630.
Nolan Systems, Inc.: *See*—
Kosina, Paul C.; and Koltko, George E., 4,457,656, Cl. 414-31.000.
Nomura, Suguru: *See*—
Katayama, Shitomi; Shimabukuro, Hajime; Nomura, Suguru; Kurita, Hiroyuki; and Ohno, Akira, 4,457,587, Cl. 350-288.000.
Nooijen, Godefridus A. H.: *See*—
van de Leemput, Lambertus J. M. A.; and Nooijen, Godefridus A. H., 4,458,028, Cl. 502-104.000.
Noranda Mines Limited: *See*—
Stanley, Robert W.; Monette, Serge; and Harris, Bryn, 4,457,897, Cl. 423-141.000.
Nordstrom, Eric W., to Union Special Corporation. Apparatus for positioning the workholder of an automatic sewing machine. 4,457,242, Cl. 112-121.120.
Noro, Takanobu: *See*—
Iwanaga, Shoichi; Sato, Nobuo; Ikegami, Akira; Isogai, Tokio; Noro, Takanobu; and Arima, Hideo, 4,457,161, Cl. 73-23.000.
Norris Industries: *See*—
Fay, John A.; Walsh, Cyral M.; and Ko, Venancio, 4,457,323, Cl. 134-18.000.
Norris, Peter C.: *See*—
Kimber, Edward G.; and Norris, Peter C., 4,457,041, Cl. 15-250.420.
Norrman, Bengt J. F.: *See*—
Tuovinen, Frans H.; Heikkila , Risto M.; Jankkila, Martti J.; Norrman, Bengt J. F.; and Honkaniemi, Matti E., 4,458,352, Cl. 373-101.000.
North West Engineering B.V.: *See*—
Dreves, Adrianus, 4,457,048, Cl. 17-1.00R.
Northern Engineering Industries plc: *See*—
Emmett, James R., 4,457,841, Cl. 209-454.000.
Northern Fibre Products Co.: *See*—
Ambrose, Jere B.; Van Compernolle, Donald D.; and Davis, Alfred L., 4,457,055, Cl. 28-111.000.
Maile, Walter E.; and Boone, David Q., 4,457,983, Cl. 428-213.000.
Northern Petrochemical Company: *See*—
Bosen, Sidney F., 4,457,852, Cl. 252-78.300.
Northland Aluminum Products, Inc.: *See*—
Jorgensen, Jorgen A.; and Nygren, Donald W., 4,457,292, Cl. 126-21.00A.
Norton Company: *See*—
Poon, Simon; and Trischuk, Ronald W., 4,457,767, Cl. 51-298.000.
Norton, William J., to C. R. Bard, Inc. Venting assembly for a sealed body fluid drainage device. 4,457,758, Cl. 604-324.000.
Novacor Medical Corporation: *See*—
Conley, Michael G.; and Petrek, James S., 4,457,673, Cl. 417-412.000.
Novak, John H.; and Smay, Gary L., to American Glass Research, Inc. Method for applying an inorganic titanium coating to a glass surface. 4,457,957, Cl. 427-226.000.
Noyes, Steven S.: *See*—
Holtey, Thomas O.; Kelly, Richard P.; and Noyes, Steven S., 4,458,308, Cl. 364-200.000.
Nozaki, Shigeki: *See*—
Takemae, Yoshihiro; Nozaki, Shigeki; Mezawa, Tsutomu; Kabashima, Katsuhiko; and Enomoto, Seiji, 4,458,337, Cl. 365-189.000.
Numasaki, Yoso: *See*—
Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; Tomioka, Kenichi; and Numasaki, Yoso, 4,457,872, Cl. 260-465.00D.
Nuovo Pignone S.p.A.: *See*—
Vinciguerra, Costantino, 4,457,634, Cl. 384-302.000.
Nusser, Alban. Method of actuating printing elements and apparatus for performing the method. 4,457,636, Cl. 400-124.000.
Nute, Alton J.: *See*—
Doster, Martha S.; Nute, Alton J.; and Christopher, Charles A., 4,457,372, Cl. 166-274.000.
Nygren, Donald W.: *See*—
Jorgensen, Jorgen A.; and Nygren, Donald W., 4,457,292, Cl. 126-21.00A.
Oak Industries, Inc.: *See*—
Hengesh, Harold F.; Marcier, Michael J.; and Van Zeeland, Anthony J., 4,458,123, Cl. 200-159.00B.
Obadia, Jacques, to Rical S.A. Tamperproof closure made of plastics material. 4,457,439, Cl. 215-256.000.
Oberman, Felix M.: *See*—
Nefedov, Anatoly P.; Oberman, Felix M.; Katoshin, Jury G.; Krugly, Semen I.; Maljuzhonok, Gennady P.; and Mikhailov, Jury S., 4,458,202, Cl. 324-204.000.
Odermann, Charles R., to Singer Company, The. Bobbin winding actuation by presser foot up switch. 4,457,245, Cl. 112-221.000.
Oeberg, Lennart; and Meyerhans, Alex, to Aktiengesellschaft Rolba. Sweeper particularly for collecting dust-like material, and the utilization thereof. 4,457,043, Cl. 15-340.000.
Oefner, Walter: *See*—
Drachenberg, Franz; and Oefner, Walter, 4,457,500, Cl. 267-148.000.
Oestreich, Ulrich: *See*—
Mayr, Ernst; and Oestreich, Ulrich, 4,457,583, Cl. 350-96.230.
Ogami, Nobutoshi; Takada, Takeshi; Shoda, Mikio; and Kurata, Yasuhiro, to Dainippon Screen Mgf., Co., Ltd. Conveying/positioning apparatus for sheet material. 4,457,419, Cl. 198-345.000.
Ogata, Hisanao: *See*—
Hakuraku, Yoshinori; Ogata, Hisanao; and Daikoku, Takahiro, 4,457,135, Cl. 62-3.000.
Ogawa, Akira; and Iida, Yasuyuki, to Toshiba Kikai Kabushiki Kaisha. Hot drink makers. 4,457,217, Cl. 99-295.000.
Ogawa, Koichi: *See*—
Kataoka, Tsunehiko; Nagara, Yoshiaki; Hashimoto, Akira; Konishi, Masayuki; and Ogawa, Koichi, 4,458,018, Cl. 435-218.000.
Ogawara, Hiroshi: *See*—
Honda, Seiichirou; Ogawara, Hiroshi; and Fukuda, Mutsumi, 4,457,782, Cl. 106-266.000.
Ogle, James A., to Burroughs Corporation. Method and apparatus for drilling holes with a laser. 4,458,134, Cl. 219-121.0LK.
Ogura, Masato; and Horio, Noriyasu, to Mitsubishi Denki Kabushiki Kaisha. Fan with variable axis impeller. 4,457,672, Cl. 417-360.000.
Ohba, Koichi, to Mitsubishi Denki Kabushiki Kaisha. Control method for multi-strand rolling mill. 4,457,154, Cl. 72-234.000.
Ohio Medical Instrument Co., Inc.: *See*—
Budde, Richard B., 4,457,300, Cl. 128-20.000.

Ohlinger, Manfred: *See*—
Rudolf, Peter; Kovacs, Jenoe; Vaeth, Guenter; and Ohlinger, Manfred, 4,457,982, Cl. 428-403.000.

Ohlschlager, Hans: *See*—
Weyde, Edith; Saleck, Wilhelm; Psaar, Hubertus; von Konig, Anita; and Ohlschlager, Hans, 4,458,009, Cl. 430-350.000.

Ohmori, Takashi: *See*—
Kikuchi, Yohsiki; and Ohmori, Takashi, 4,458,252, Cl. 346-74.400.

Ohno, Akira: *See*—
Katayama, Shitomi; Shimabukuro, Hajime; Nomura, Suguru; Kurita, Hiroyuki; and Ohno, Akira, 4,457,587, Cl. 350-288.000.
Shimabukuro, Hajime; Watanabe, Shuichi; Katayama, Shitomi; and Ohno, Akira, 4,457,598, Cl. 350-288.000.

Ohsaki, Takashi; and Abe, Susumu, to Kuraray Chemical Co., Ltd. Process for manufacturing molecular sieving carbon. 4,458,022, Cl. 502-42.000.

Ohta, Takeo: *See*—
Kotera, Koichi; and Ohta, Takeo, 4,457,794, Cl. 156-64.000.

Ohyama, Masumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Foreground subject-identifying apparatus. 4,458,235, Cl. 382-1.000.

Oishi, Kazuaki: *See*—
Takeuti, Susumu; Sakaguchi, Minoru; Aoyama, Takanobu; and Oishi, Kazuaki, 4,458,099, Cl. 174-27.000.

Ojima, Juji, to NHK Spring Co., Ltd. Spring balancer for pivotable cover lid. 4,457,497, Cl. 267-9.00R.

Okada, Hitoshi; Takai, Kazuki; and Yamaguchi, Katsumi, to Clarion Co., Ltd. Magnetic tape recording/reproducing apparatus with eject spring set by tape drive motor. 4,458,276, Cl. 360-96.500.

Okada, Satoshi: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Arstani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,458,078, Cl. 548-227.000.

Okada, Seizo: *See*—
Horigome, Koichi; Okada, Seizo; Nishimura, Katsuji; and Yamamoto, Hachizou, 4,458,317, Cl. 364-406.000.

Okamoto, Kazuo: *See*—
Matsui, Masao; Naito, Hiroshi; and Okamoto, Kazuo, 4,457,973, Cl. 428-372.000.

Okamura, Kazuo; Tamura, Kohji; Daimon, Shigeo; and Shibuya, Yoshiyuki, to Daikin Kogyo Company, Ltd. Process for producing magnetizable particles. 4,457,955, Cl. 427-127.000.

Okamura, Masatoshi; and Shiba, Haruo, to TDK Electronics Co., Ltd. Magnetic tape cartridge. 4,457,474, Cl. 242-199.000.

Okugami, Kiyoshi: *See*—
Suzuki, Hiroo; Kuno, Tadashi; Yoshimura, Yasuo; Okugami, Kiyoshi; Hotta, Hisashi; and Otsuka, Shinya, 4,458,040, Cl. 523-412.000.

Okumura, Jun: *See*—
Kamachi, Hajime; Okumura, Jun; and Naito, Takayuki, 4,457,929, Cl. 424-246.000.

Olaisen, Hermund: *See*—
Kino, Gordon S.; Behar, David; Bowers, John E.; and Olaisen, Hermund, 4,458,328, Cl. 364-825.000.

Oleck, Stephen M.; and Wilson, Robert C., Jr., to Mobil Oil Corporation. Process for hydrotreating petroleum residua and catalyst therefor. 4,458,024, Cl. 502-66.000.

Olesch, Reinhard G.: *See*—
Rittenbach, Otto E.; and Olesch, Reinhard G., 4,458,240, Cl. 340-552.000.

Olivetti Tecnost, S.p.A.: *See*—
Monti, Alberto, 4,458,275, Cl. 360-78.000.

Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, to SKF Kugellagerfabriken GmbH. Pin for tension rollers. 4,457,740, Cl. 474-112.000.

Olsen, Charles R. Revolving firearms. 4,457,093, Cl. 42-59.000.

Olympus Optical Co. Ltd.: *See*—
Kondo, Isao; and Nakajima, Yukio, 4,457,601, Cl. 354-418.000.
Mihara, Shinichi, 4,457,595, Cl. 350-454.000.
Mizokami, Kazunori, 4,457,602, Cl. 354-416.000.
Nishikawa, Masaji, 4,457,993, Cl. 430-54.000.
Shiono, Kazuo, 4,457,184, Cl. 73-864.110.
Takekawa, Hiroshi, 4,457,893, Cl. 422-64.000.

Omega-P, Inc.: *See*—
Hirshfield, Jay L.; and Krishnan, Mahadevan, 4,458,148, Cl. 250-284.000.

Omo, R. B., Jr., to Bath Iron Works Corporation. Adjustable shoe clutch and brake assembly. 4,457,415, Cl. 192-12.00C.

Omura, Yasuhisa, to Nippon Telegraph & Telephone Public Corp. Insulated gate type transistors. 4,458,261, Cl. 357-23.700.

Ono, Hiromitsu: *See*—
Inagaki, Mitsukane; Hattori, Mitsuhiro; and Ono, Hiromitsu, 4,457,675, Cl. 418-14.000.

Ooyama, Toshiro, to Dainabot Kabushiki Kaisha. Method for the immunoassay of elastase-1 and a set of reagents for such immunoassay. 4,458,013, Cl. 435-7.000.

Ophir, Zohar: *See*—
Jaffe, Michael; and Ophir, Zohar, 4,457,962, Cl. 428-36.000.

Ornato, Joseph P.; Fennigkoh, Larry; and Jaeger, Colleen S., to University of Nebraska, The Board of Regents of the. Method and apparatus for providing records of events during a cardiac arrest. 4,457,312, Cl. 128-711.000.

Osada, Mitsuo; Kuroishi, Nobuhito; Amano, Yoshinari; and Fukui, Akira, to Sumitomo Electric Industries, Ltd. Electric contact materials. 4,457,780, Cl. 75-236.000.

Osaka Gas Company Limited: *See*—
Kashimoto, Hiroo; Kosa, Tadatoshi; Inoue, Akihiko; Yamamoto, Shigemitu; and Kuroishi, Katuhiko, 4,458,108, Cl. 174-152.00R.

Osaki, Tatsuo, to Yoshida Kogyo K. K. Method of and apparatus for detecting ends of successive fly strips connected by a slide fastener chain. 4,457,062, Cl. 29-408.000.

Oscar Mayer Foods Corporation: *See*—
Mally, Timothy G., 4,457,194, Cl. 83-42.000.

Oshida, Yoshitada: *See*—
Shiba, Masataka; and Oshida, Yoshitada, 4,458,302, Cl. 362-303.000.

Oshima, Masanao; and Tabuchi, Hiroshi, to Mitsui Engineering & Shipbuilding Co., Ltd. Floating-type offshore structure. 4,457,250, Cl. 114-265.000.

Osmanian, Karo A.: *See*—
Timoshenko, Grigory M.; Kravets, Vladimir G.; Timoshenko, Vladimir G.; Zima, Petr F.; Astrakhan, Alexandr Z.; Overko, Valentin M.; Isadchenko, Vasily S.; Lenenko, Stanislav A.; Goldynsky, Gennady G.; Osmanian, Karo A.; Aralov, Evgeny G.; Maleev, Georgy V.; Kuzmich, Igor A.; Ekber, Boris Y.; and Kreschenko, Nikolai A., 4,457,331, Cl. 137-119.000.

Ostapchenko, George J.: *See*—
Hatchadoorian, Edward; Ostapchenko, George J.; Patton, James L.; and Young, Harlan S., 4,457,797, Cl. 156-242.000.

Otala, Matti N., to Shin-Shirasuna Electric Corp. Method for electrical and thermal protection of output devices of electronic amplifiers. 4,458,284, Cl. 361-79.000.

Otani, Sugio; Yanagisawa, Sadakatsu; and Niijima, Kunio, to Mitsubishi Chemical Industries, Ltd.; Otani, Sugio; Yanagisawa, Sadakatsu; and Niijima, Kunio. Carbon artificial prosthetic material. 4,457,984, Cl. 428-220.000.

Otis Elevator Company: *See*—
Johns, Calvin E., 4,457,405, Cl. 187-52.0LC.

Otis Engineering Corporation: *See*—
Henderson, William D., 4,457,369, Cl. 166-125.000.

Otsuka, Hiromitsu: *See*—
Takeuchi, Sakazo; Ban, Kikuo; Inoue, Akira; and Otsuka, Hiromitsu, 4,457,535, Cl. 280-650.000.

Otsuka, Shinya: *See*—
Suzuki, Hiroo; Kuno, Tadashi; Yoshimura, Yasuo; Okugami, Kiyoshi; Hotta, Hisashi; and Otsuka, Shinya, 4,458,040, Cl. 523-412.000.

Otsuka, Shoichi: *See*—
Inaba, Hajimu; Miyashita, Hideo; and Otsuka, Shoichi, 4,458,188, Cl. 318-568.000.

Otsuka, Toyozo: *See*—
Kitsugi, Naomichi; Fujinaga, Teruo; and Otsuka, Toyozo, 4,457,901, Cl. 423-341.000.

Outboard Marine Corporation: *See*—
Fitch, Ralph H., 4,457,271, Cl. 123-187.50R.
Flaig, John D., 4,457,727, Cl. 440-88.000.

Outokumpu Oy: *See*—
Tuovinen, Frans H.; Heikkila , Risto M.; Jankkila, Martti J.; Norrman, Bengt J. F.; and Honkaniemi, Matti E., 4,458,352, Cl. 373-101.000.

Overko, Valentin M.: *See*—
Timoshenko, Grigory M.; Kravets, Vladimir G.; Timoshenko, Vladimir G.; Zima, Petr F.; Astrakhan, Alexandr Z.; Overko, Valentin M.; Isadchenko, Vasily S.; Lenenko, Stanislav A.; Goldynsky, Gennady G.; Osmanian, Karo A.; Aralov, Evgeny G.; Maleev, Georgy V.; Kuzmich, Igor A.; Ekber, Boris Y.; and Kreschenko, Nikolai A., 4,457,331, Cl. 137-119.000.

Owensby, Joseph E.: *See*—
Atkins, J. Harell; and Owensby, Joseph E., 4,457,122, Cl. 53-434.000.

Oximetrix, Inc.: *See*—
Pastrone, Giovanni, 4,457,753, Cl. 604-153.000.

Oya, Masayuki: *See*—
Iwao, Junichi; Oya, Masayuki; Baba, Toshio; Iso, Tadashi; and Chiba, Takehisa, 4,457,935, Cl. 424-270.000.

P.H.D. of Puerto Rico, Inc.: *See*—
Hubbard, Leo J.; Hubbard, Raymond P.; and Strobel, Erwin J., 4,457,463, Cl. 226-74.000.

P. L. Porter Company: *See*—
Porter, Clyde R., 4,457,406, Cl. 188-67.000.

P.M. Plasmatic (Leicester) Limited: *See*—
Hanks, Robert S.; and Brodrick, Philip H., 4,457,445, Cl. 220-214.000.

Pachter, Irwin J.: *See*—
Gordon, Maxwell; and Pachter, Irwin J., 4,457,933, Cl. 424-260.000.

Paget, Win W. Rotary compressor. 4,457,680, Cl. 418-191.000.

Pai, Damodar M.; and Yanus, John F., to Xerox Corporation. Photoresponsive device containing arylmethanes. 4,457,994, Cl. 430-59.000.

Palley, Igor: *See*—
Harpell, Gary A.; Kavesh, Sheldon; Palley, Igor; and Prevorsek, Dusan C., 4,457,985, Cl. 428-224.000.

Palmer, Jay W.; and Gaynor, John C., to United States Gypsum Company. Method for solidifying waste slime suspensions. 4,457,781, Cl. 106-109.000.

Pannell Manufacturing Corp.: *See*—
Pannell, Robert T., 4,457,630, Cl. 366-345.000.

Pannell, Robert T., to Pannell Manufacturing Corp. Compost processing machine. 4,457,630, Cl. 366-345.000.

Papalos, John G.; Villa, Jose L.; Knitter, Kathy A.; and Savoly, Arpad, to Diamond Shamrock Chemicals Company. Stabilized water slurries of carbonaceous materials. 4,457,762, Cl. 44-51.000.

Papalos, John G.; and Savoly, Arpad, to Diamond Shamrock Chemicals Company. Condensation products of substituted phenol sulfonic acid and formaldehyde. 4,457,874, Cl. 260-512.00C.
Papenhagen, Dieter; Wallentowitz, Henning; Lepler, Gerhard; and Hampp, Martin, to Daimler-Benz Aktiengesellschaft. Linkage for operating a control element of an internal combustion engine. 4,457,189, Cl. 74-513.000.
Park, Kisoon, to Union Carbide Corporation. Method for autodeposition onto a non-metallic surface. 4,457,956, Cl. 427-203.000.
Park, Myong-Gi A.: *See*—
Grivas, John C.; and Park, Myong-Gi A., 4,457,806, Cl. 203-9.000.
Park-Ohio Industries, Inc.: *See*—
Pusateri, James J.; Bartlett, Charles R.; and Brazie, Paul D., 4,458,127, Cl. 219-10.790.
Parker Chemical Company: *See*—
Lindert, Andreas; and Kramer, Jack A., 4,457,790, Cl. 148-6.15R.
Parker-Hannifin Corporation: *See*—
Sharp, Bernard C.; and Evans, Raymond J., 4,457,586, Cl. 350-281.000.
Parks, Jack E.; and Blanchfield, John H., to Southern Railway Company. Rail anchor remover. 4,457,060, Cl. 29-239.000.
Parschat, Lothar: *See*—
Gruner, Hans; Schrewe, Hans; Pleschiutschnigg, Fritz-Peter; and Parschat, Lothar, 4,458,155, Cl. 250-572.000.
Partyka, Richard A.; and Hudyma, Thomas W., to Bristol-Myers Company. Sulfur-containing imidazoles. 4,458,079, Cl. 548-341.000.
Pasquale, Antonio: *See*—
Marraccini, Antonio; Pieroni, Marcello; Pasquale, Antonio; and Balducci, Luigi, 4,458,073, Cl. 546-14.000.
Passler, Helmar: *See*—
Bobeth, Wolfgang; Heger, Adolf; and Passler, Helmar, 4,457,817, Cl. 204-159.150.
Pastor, Manuel G., to Zerpa Industries, Inc. Solvent recovery apparatus and method. 4,457,805, Cl. 202-83.000.
Pastrone, Giovanni, to Oximetrix, Inc. Intravenous metering device. 4,457,753, Cl. 604-153.000.
Patch, Gerald P.: *See*—
Ashbee, William H.; Beran, Mark A.; Colglazier, Donald F.; Janssen, Donovan M.; Mantey, John P.; Martin, Ronald J.; Patch, Gerald P.; Rittenhouse, Larry E.; and Valent, James A., 4,457,506, Cl. 271-3.100.
Patrickson, David J.; Webster, John D.; and Schwartz, Edward, to U.S. Philips Corporation. Cathode ray tube processing. 4,457,731, Cl. 445-2.000.
Patterson & Patterson, Inc.: *See*—
Breisch, John H., 4,457,399, Cl. 182-185.000.
Patton, James L.: *See*—
Hatchadoorian, Edward; Ostapchenko, George J.; Patton, James L.; and Young, Harlan S., 4,457,797, Cl. 156-242.000.
Paul, James C.: *See*—
Gielow, Robert L.; and Paul, James C., 4,457,550, Cl. 296-1.00S.
Pauliukonis, Richard S. Rotary actuator with energy conservation. 4,457,210, Cl. 91-355.000.
Pauliukonis, Richard S. Force balanced die cylinders. 4,457,498, Cl. 267-130.000.
Paulus, Wilfried: *See*—
Schmitt, Hans-Georg; Paulus, Wilfried; Genth, Hermann; Brandes, Wilhelm; Reinecke, Paul; and Scheinpflug, Hans, 4,457,930, Cl. 424-248.500.
Pav, Josef, to Kleinewegers GmbH. Flexure-resistant roll for use in calenders or the like. 4,457,057, Cl. 29-116.0AD.
Paxman, Colin J. Darts. 4,457,514, Cl. 273-420.000.
Payne, Larry D., to T. D. Williamson, Inc. Pipeline pig having improved means of sensing changes in the internal configuration of a pipeline. 4,457,073, Cl. 33-178.00F.
Peddinghaus, Rolf: *See*—
Wepner, Joachim; Barysch, Hubert; and Kruse, Erwin, 4,457,197, Cl. 83-197.000.
Pederson, Bjorn O.: *See*—
Cookson, Alan H.; and Pederson, Bjorn O., 4,458,100, Cl. 174-28.000.
Peerlkamp, Erik R., to Stamicarbon B.V. Polyolefin layer with improved adhesion to a foamed plastic substrate and a method for its manufacture. 4,457,729, Cl. 441-74.000.
Peloza, Kirk B.: *See*—
Kenny, Andrew A.; and Peloza, Kirk B., 4,458,116, Cl. 200-61.890.
Penneck, Richard J.; Thomas, David H.; and Cox, Allan J., to Raychem Limited. Dimensionally recoverable articles. 4,458,104, Cl. 174-88.00R.
Penner, James W.: *See*—
Adrian, Glenn J.; Adrian, Harry W.; and Penner, James W., 4,458,138, Cl. 219-304.000.
Pennwalt Corporation: *See*—
Ireland, Ronald; and Powell, Harold R., 4,457,662, Cl. 414-331.000.
Sudrabin, Leon P.; and Kaiser, Paul, 4,457,821, Cl. 204-196.000.
Penrose, John J.: *See*—
Stephens, Arthur W.; and Penrose, John J., 4,458,299, Cl. 362-158.000.
Penta, Inc.: *See*—
Uchenick, Gordon, 4,458,315, Cl. 364-200.000.
Penterson, Craig A.: *See*—
Itse, Daniel C.; and Penterson, Craig A., 4,457,241, Cl. 110-347.000.
Pepper, Kenneth V., to Bemis Manufacturing Company. Temperature responsive valve mechanism. 4,457,327, Cl. 137-67.000.
Perkin-Elmer Corporation, The: *See*—
Bohler, Walter; and Barnard, Thomas W., 4,457,623, Cl. 356-307.000.
Perkins, William C., to Rockwell International Corporation. Communications signal coupling around wye/delta power transformation. 4,458,236, Cl. 340-310.00R.
Permelec Electrode Ltd.: *See*—
Asano, Hiroshi; Shimamune, Takayuki; and Goto, Toshiki, 4,457,822, Cl. 204-252.000.
Persson, Kjell O. Wheel assembly. 4,457,526, Cl. 280-5.260.
Pertschuk, Daniel M. Exercising apparatus. 4,457,510, Cl. 272-93.000.
Peter, Heinrich; and Bickel, Hans, to Ciba-Geigy Corporation. Cephalosporin compounds. 4,458,069, Cl. 544-16.000.
Peters, Alan W.: *See*—
Welsh, William A.; Seese, Mark A.; and Peters, Alan W., 4,458,023, Cl. 502-65.000.
Petersen, Christian C., to Polaroid Corporation. Electromagnetic actuators. 4,458,227, Cl. 335-222.000.
Peterson, Philip C. Safety apparatus for motor vehicles. 4,458,115, Cl. 200-61.850.
Petrek, James S.: *See*—
Conley, Michael G.; and Petrek, James S., 4,457,673, Cl. 417-412.000.
Petrova, Aleftina P.: *See*—
Chernikhov, Alexei Y.; Yakovlev, Mikhail N.; Rogov, Nikolai S.; Petrova, Aleftina P.; Martirosov, Eduard B.; and Gul, Valentin E., 4,458,041, Cl. 523-435.000.
Pettersson, Erland: *See*—
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Pettersson, Karl-Axel G., to Ahl, Sven-Erik. Means for conveying a mixture of products having different density. 4,457,648, Cl. 406-175.000.
Pfizer, Inc.: *See*—
Jasys, Vytautas J.; and Kellogg, Michael S., 4,457,924, Cl. 424-226.000.
Nakanishi, Susumu, 4,458,070, Cl. 544-27.000.
Schnur, Rodney C., 4,457,939, Cl. 424-273.00R.
Phelon Magnagrip Co., Inc.: *See*—
Cooper, Rosemary J.; Ratnam, Devineni V.; and Burson, Bob O., 4,457,425, Cl. 206-38.000.
Phillips, David J.; and Glazer, Jerome L., to Air Products and Chemicals, Inc. Process for the production of ethylene and propylene. 4,458,096, Cl. 585-302.000.
Phillips Petroleum Company: *See*—
Bellinger, Robert M., 4,457,768, Cl. 62-21.000.
Kukes, Simon G., 4,457,835, Cl. 208-251.00H.
La Spisa, Ronald J., 4,457,266, Cl. 122-451.100.
McKay, Dwight L., 4,457,693, Cl. 431-2.000.
Phillips, Robert F.: *See*—
McIntyre, James A.; and Phillips, Robert F., 4,457,953, Cl. 427-113.000.
Phillips, Wilbert H., Jr. Decorative, illuminated automotive reflector. 4,457,089, Cl. 40-544.000.
Pichler, Johann: *See*—
Theurer, Josef; and Pichler, Johann, 4,457,234, Cl. 104-7.00B.
Pichler, Rudolf: *See*—
Weinzinger, Hans J.; and Pichler, Rudolf, 4,457,149, Cl. 72-10.000.
Pickenhahn, Josef, to Lucas Industries Limited. Brake isolator valve. 4,457,562, Cl. 303-6.00A.
Picker International Limited: *See*—
Young, Ian R., 4,458,203, Cl. 324-309.000.
Pierburg GmbH & Co. KG.: *See*—
Baumgartner, Hans, 4,458,228, Cl. 335-229.000.
Habel, Georg; Heidemanns, Rolf-Peter; and Muller, Hans-Jurgen, 4,457,278, Cl. 123-438.000.
Pierce, Myrl D.: *See*—
Leiher, Alfred J.; Schmid, Daniel; and Pierce, Myrl D., 4,457,117, Cl. 52-238.100.
Pieroni, Marcello: *See*—
Marraccini, Antonio; Pieroni, Marcello; Pasquale, Antonio; and Balducci, Luigi, 4,458,073, Cl. 546-14.000.
Piezo Electric Products, Inc.: *See*—
Kolm, Eric A.; and Kolm, Henry H., 4,458,171, Cl. 310-330.000.
Pilot Ink Co., Ltd.: *See*—
Yokosuka, Takehiko, 4,457,644, Cl. 401-216.000.
Pipich, Charles W.: *See*—
Nathenson, Richard D.; Pipich, Charles W.; and Kopnitsky, Joseph R., deceased, 4,458,166, Cl. 310-71.000.
Pippinger, Horst, to Elba-Werk Maschinen-Gesellschaft mbH & Co. Apparatus for storing and dispensing several bulk materials. 4,457,660, Cl. 414-332.000.
Piteo, Michael J., to R. E. Phelon Company, Inc. Electronic regulator for alternator battery charging system. 4,458,195, Cl. 322-94.000.
Pitney Bowes Inc.: *See*—
Tolmie, Robert J., Jr., 4,457,617, Cl. 355-13.000.
Pittman, Edgar H.: *See*—
Schroder, William J.; and Pittman, Edgar H., 4,457,129, Cl. 57-284.000.
Pittsburg & Midway Coal Mining Co., The: *See*—
Carr, Norman L.; Prudich, Michael E.; King, William E., Jr.; and Moon, William G., 4,457,826, Cl. 208-8.0LE.
Plante, Sabrina K.: *See*—
Faith, Thomas J., Jr.; Irven, Robert S.; and Plante, Sabrina K., 4,457,976, Cl. 428-457.000.

Plantema, Otto G.: *See—*
Rulkens, Peter F. M.; Haasen, Nicolaas F.; and Plantema, Otto G., 4,457,807, Cl. 203-72.000.
Plantureux, Alain, to Chancel, Jean-Louis. Carrying out said process and the resulting jewels. 4,457,056, Cl. 29-10.000.
Plempel, Manfred: *See—*
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Pleschiutschnigg, Fritz-Peter: *See—*
Gruner, Hans; Schrewe, Hans; Pleschiutschnigg, Fritz-Peter; and Parschat, Lothar, 4,458,155, Cl. 250-572.000.
Plester, Karl-Heinz: *See—*
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Plettner, Horst: *See—*
Korner, Gerhard; and Plettner, Horst, 4,458,120, Cl. 200-148.00A.
Pljusnina, Tamara S.: *See—*
Ivaschenko, Alexandr V.; Lazareva, Valentina T.; Prudnikova, Elena K.; Rumyantsev, Vladimir G.; Pljusnina, Tamara S.; Nefedov, Viktor A.; Blinov, Lev M.; Titov, Viktor V.; Sevostyanov, Vladimir P.; and Shoshin, Vadim M., 4,457,859, Cl. 252-299.610.
Ploeger, Walter, Jr. Method of growing grapevines. 4,457,102, Cl. 47-58.000.
Plummer, William T., to Polaroid Corporation. Optical system for use in electronic enlarger. 4,457,618, Cl. 355-20.000.
Poduje, Noel S.: *See—*
Judell, Neil H.; Abbe, Robert C.; Poduje, Noel S.; and Mallory, Roy, 4,457,664, Cl. 414-779.000.
Poe, Lee G.: *See—*
Finke, Harry P.; Morgan, John W., II; and Poe, Lee G., 4,457,706, Cl. 432-226.000.
Polaroid Corporation: *See—*
Baker, James G., 4,457,592, Cl. 350-432.000.
Kisler, Semyon; Chirokas, Edwin A.; and Foster, Donald A., 4,457,256, Cl. 118-621.000.
Petersen, Christian C., 4,458,227, Cl. 335-222.000.
Plummer, William T., 4,457,618, Cl. 355-20.000.
Taylor, Lloyd D., 4,458,001, Cl. 430-215.000.
Pollet, Gilbert: *See—*
du Manoir de Juaye, Pierre; Guerit, Pierre; Pollet, Gilbert; and Vassiliadis, Marc, 4,457,496, Cl. 266-227.000.
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Acda, Petrus M.; and Karreman, Jacob, 4,457,886, Cl. 264-249.000.
Polysar Limited: *See—*
Dunn, John R., 4,457,799, Cl. 156-307.100.
Polysciences, Inc.: *See—*
Boettner, Fred E., 4,458,082, Cl. 548-453.000.
Pons, Robert L.: *See—*
Sobczak, Isidore F.; Cleveland, William C., Jr.; and Pons, Robert L., 4,457,297, Cl. 126-424.000.
Poon, Simon; and Trischuk, Ronald W., to Norton Company. Alumina-zirconia abrasive. 4,457,767, Cl. 51-298.000.
Porenski, Harry S.: *See—*
Lamb, Charles G.; and Porenski, Harry S., 4,457,319, Cl. 131-336.000.
Porsche, Arthur F., to Dow Corning Corporation. Process for reaction injection molding of silicone containing polyurethanes. 4,457,887, Cl. 264-300.000.
Portales, Jean-Luc: *See—*
Crosnier, Bernard; Duruisseaud, Pierre; Fras, Gilles; Jouanna, Paul; and Portales, Jean-Luc, 4,458,245, Cl. 340-853.000.
Porter, Clyde R., to P. L. Porter Company. Improved friction lock. 4,457,406, Cl. 188-67.000.
Porter, Garry L., to Clear Lake Development Group. Composition and method for protecting a therapeutic drug. 4,457,907, Cl. 424-7.100.
Post, Lloyd D., to United States of America, Army. Artillery fuze for practice and tactical munitions. 4,457,232, Cl. 102-233.000.
Potoski, John R., to American Home Products Corporation. Heterocyclic anti-ulcer agents. 4,458,077, Cl. 548-197.000.
Powell, Harold R.: *See—*
Ireland, Ronald; and Powell, Harold R., 4,457,662, Cl. 414-331.000.
PPG Industries, Inc.: *See—*
Das, Balbhadra; and Melle, Carl A., 4,457,970, Cl. 428-290.000.
Hsu, Edward C.; and Temple, Chester S., 4,457,785, Cl. 106-308.00N.
Levin, Mark, 4,457,815, Cl. 204-98.000.
Praschl, Wilhelm: *See—*
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Pratt, John D. Composite buckling blind fastener. 4,457,652, Cl. 411-38.000.
Pratt & Whitney Canada Inc.: *See—*
Crawford, William K.; and Kovacik, Ronnie, 4,457,568, Cl. 308-207.00A.
Precision Cosmet Co., Inc.: *See—*
Sliger, Richard, 4,457,761, Cl. 8-507.000.
Precision Fukuhara Works, Ltd.: *See—*
Sawazaki, Masatoshi, 4,457,144, Cl. 66-132.00T.
Precision Surgical Instruments, Inc.: *See—*
Caspari, Richard B.; Whipple, Terry L.; and Thimsen, James A., 4,457,302, Cl. 128-133.000.
Premel, Ulrich; and Thones, Gustav, to L. & C. Steinmuller GmbH. Connection element for the transfer of knock- or impact-energy upon heating or cooling surfaces to be cleaned and located in a pressure vessel. 4,457,361, Cl. 165-84.000.
Premel, Ulrich: *See—*
Dorling, Rolf; and Premel, Ulrich, 4,457,764, Cl. 48-62.00R.
Pressure Science Incorporated: *See—*
Halling, Horace P.; and Barrett, Robert A., 4,457,523, Cl. 277-236.000.
Prevorsek, Dusan C.: *See—*
Harpell, Gary A.; Kavesh, Sheldon; Palley, Igor; and Prevorsek, Dusan C., 4,457,985, Cl. 428-224.000.
Price, David W.: *See—*
Evans, Edwin L.; Sidebottom, Ronald; Price, David W.; and Bonafont, Roger L., 4,458,043, Cl. 524-66.000.
Price, Larry L. Apparatus for cutting lengths of lumber into blocks. 4,457,198, Cl. 83-411.00A.
Price, Robert P.: *See—*
Shanks, Thomas P.; and Price, Robert P., 4,457,305, Cl. 128-205.120.
Prigent, Michel, to Institut Francais du Petrole. Catalytic muffler for purifying the exhaust gases of an internal combustion engine. 4,457,895, Cl. 422-179.000.
Princeton Tectonics: *See—*
Stephens, Arthur W.; and Penrose, John J., 4,458,299, Cl. 362-158.000.
Princz, Zoltan: *See—*
Fekete, Kalman; Karnischer, Tamas; Malovecz, Istvan; Tuba, Istvan; Lukasics, Bela; Makk nee Petranyi, Magdolna; Princz, Zoltan; and Szabo, Antal, 4,457,759, Cl. 8-94.160.
Prior, James: *See—*
Braithwaite, John D.; King, Derrick O.; Williams, Sidney J.; and Prior, James, 4,457,642, Cl. 401-188.00R.
Procedyne Corp.: *See—*
Staffin, Herbert K.; and Staffin, Robert, 4,457,788, Cl. 148-20.300.
Procter & Gamble Company, The: *See—*
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Mitchell, Sharon J.; and Spinner, Jonathon, 4,457,856, Cl. 252-166.000.
Prodelin, Inc.: *See—*
Bondon, David L., 4,458,251, Cl. 343-914.000.
Produits Chimiques Ugine Kuhlmann: *See—*
Cholley, Jean-Marie, 4,457,760, Cl. 8-111.000.
Prokic-Immel, Ricarda: *See—*
Becher, Heinz-Manfred; Prokic-Immel, Ricarda; and Wirtz, Walter, 4,457,943, Cl. 424-322.000.
Provi, Mike A., to Brearly Company, The. Platform scale with bendable load sensing beam. 4,457,385, Cl. 177-211.000.
Prudich, Michael E.: *See—*
Carr, Norman L.; Prudich, Michael E.; King, William E., Jr.; and Moon, William G., 4,457,826, Cl. 208-8.0LE.
Prudnikova, Elena K.: *See—*
Ivaschenko, Alexandr V.; Lazareva, Valentina T.; Prudnikova, Elena K.; Rumyantsev, Vladimir G.; Pljusnina, Tamara S.; Nefedov, Viktor A.; Blinov, Lev M.; Titov, Viktor V.; Sevostyanov, Vladimir P.; and Shoshin, Vadim M., 4,457,859, Cl. 252-299.610.
Pryor, Eugene F. Stereoscopic viewer with variable fields of vision. 4,457,584, Cl. 350-137.000.
Psaar, Hubertus: *See—*
Weyde, Edith; Saleck, Wilhelm; Psaar, Hubertus; von Konig, Anita; and Ohlschlager, Hans, 4,458,009, Cl. 430-350.000.
Psi Limited: *See—*
Frankenberg, Henry E., 4,458,241, Cl. 340-571.000.
Ptasinski, James F.: *See—*
Wheeler, Glenn; and Ptasinski, James F., 4,458,163, Cl. 307-466.000.
Pusateri, James J.; Bartlett, Charles R.; and Brazie, Paul D., to Park-Ohio Industries, Inc. Inductor for annealing work hardened portions of structural beams. 4,458,127, Cl. 219-10.790.
Pusch, Gunter; Hoffman, Alexander; Aisslinger, Dieter E.; and Pusch, Klaus W., to Pusch, Gunter. Cover-substrate support material. 4,457,966, Cl. 428-204.000.
Pusch, Klaus W.: *See—*
Pusch, Gunter; Hoffman, Alexander; Aisslinger, Dieter E.; and Pusch, Klaus W., 4,457,966, Cl. 428-204.000.
Qiu, Yuanxun: *See—*
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Quad Environmental Technologies Corporation: *See—*
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Quan, Ronald, to Sony Corporation. Constant quiescent current, class AB amplifier output stage. 4,458,213, Cl. 330-267.000.
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Bohn, Joseph W.; Cohen, Peter A.; and Zuraw, Bruce L., 4,458,020, Cl. 435-296.000.
R. E. Phelon Company, Inc.: *See—*
Piteo, Michael J., 4,458,195, Cl. 322-94.000.
R. M. Smith, Inc.: *See—*
Hauger, Harry L.; and Beal, Glenn L., 4,457,470, Cl. 239-230.000.
Racal-Vadic, Inc.: *See—*
Bingham, John A. C., 4,458,216, Cl. 332-9.00R.
Rado, Theodore A., to Kerr-McGee Chemical Corporation. Critical solvent separations in inorganic systems. 4,457,812, Cl. 204-66.000.
Rafique, Syed O. Z. M.: *See—*
Love, James P.; and Rafique, Syed O. Z. M., 4,457,877, Cl. 261-64.00B.
Ragle, Herbert U.; and DeMoss, Dean, to Burroughs Corporation. Spacers for end-wise pneumatic partitioned disk pack. 4,458,277, Cl. 360-99.000.

Railroad Concrete Crosstie Corporation: *See—*
Hales, Harvey E., deceased; and Fredrick, Edmund R., 4,457,468, Cl. 238-8.000.

Ramesohl, Hubert; and Herchenbach, Horst, to Klockner-Humboldt-Deutz AG. Calcining system for the manufacture of cement clinker and the like. 4,457,705, Cl. 432-106.000.

Ramlow, Gerhard G.; Heyman, Duane A.; and Grace, Oscar M., to BASF Wyandotte Corporation. Process for the preparation of white graft polymer dispersions and flame-retardant polyurethane foams. 4,458,038, Cl. 521-137.000.

Ramsey, S. David, Jr.; and Taenzer, Jon C., to Siemens AG. Insonification apparatus for an ultrasound transmission system. 4,457,175, Cl. 73-606.000.

Rantanen, Rauno: *See—*
Venalainen, Heikki; and Rantanen, Rauno, 4,458,360, Cl. 378-50.000.

Rao, G. R. Mohan; and Redwine, Donald J., to Texas Instruments Incorporated. Method of making single-level polysilicon dynamic memory array. 4,457,066, Cl. 29-571.000.

Rapp, Guenther: *See—*
Grosskinsky, Otto-Alfred; Frommer, Elmar; Rapp, Guenther; and Thomas, Erwin, 4,457,906, Cl. 423-387.000.

Rastelli, Agostino A., to Leitner Corporation. Modular refrigeration unit and cabinet systems therewith. 4,457,140, Cl. 62-261.000.

Ratchford, Lloyd G., to Bendix Corporation, The. Coupling nut for an electrical connector. 4,457,469, Cl. 339-89.00M.

Ratnam, Devineni V.: *See—*
Cooper, Rosemary J.; Ratnam, Devineni V.; and Burson, Bob O., 4,457,425, Cl. 206-38.000.

Raudat, John L.: *See—*
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Raychem Limited: *See—*
Penneck, Richard J.; Thomas, David H.; and Cox, Allan J., 4,458,104, Cl. 174-88.00R.

Rayovac Corporation: *See—*
Feldhake, Ralph H., 4,457,991, Cl. 429-174.000.

Raytheon Company: *See—*
Berlik, Lee J., 4,457,293, Cl. 126-39.00N.
Chabinsky, Irving J., 4,458,128, Cl. 219-10.55R.
Durschlag, Mark S.; and Vorhaus, James L., 4,458,295, Cl. 361-322.000.
Kasevich, Raymond S.; Kolker, Myer; and Dwyer, Arthur S., 4,457,365, Cl. 166-60.000.
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RCA Corporation: *See—*
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Huang, Ho-Chung; and Mawhinney, Daniel D., 4,458,215, Cl. 331-117.00D.
Landry, Norman R.; and Yorinks, Leonard H., 4,458,229, Cl. 333-248.000.
Samuels, Gerard, 4,457,259, Cl. 118-705.000.
Schroeder, Alfred C., 4,458,269, Cl. 358-167.000.

RCA Inc.: *See—*
McIntyre, Robert J.; and Webb, Paul P., 4,458,260, Cl. 357-30.000.

Ream, Michael D., to Up-Right, Inc. Self-propelled elevating work platform. 4,457,403, Cl. 187-18.000.

Rebick, Charles: *See—*
Seiver, Robert L.; Rebick, Charles; and Goetsch, Duane A., 4,457,836, Cl. 208-254.00H.

Rebsdat, Siegfried; Mayer, Sigmund; and Alfranseder, Josef, to Hoechst Aktiengesellschaft. Silver catalysts, a process for their preparation, and their use in preparing ethylene oxide. 4,458,032, Cl. 502-348.000.

Redwine, Donald J.: *See—*
Rao, G. R. Mohan; and Redwine, Donald J., 4,457,066, Cl. 29-571.000.

Reed Lignin Inc.: *See—*
Detroit, William J., 4,457,853, Cl. 252-8.50A.

Reel-O-Matic Systems, Inc.: *See—*
Brooks, Dannie L., 4,457,195, Cl. 83-69.000.

Reeves, Frederick. Fruit crowner. 4,457,070, Cl. 30-314.000.

Regel, Erik: *See—*
von Bittera, Miklos; Buchel, Karl H.; Plempel, Manfred; and Regel, Erik, 4,457,938, Cl. 424-273.00R.

Regie Nationale des Usines Renault: *See—*
Guichard, Michel; and Jouaire, Alain, 4,458,135, Cl. 219-127.000.

Regipa, Robert, to Centre National d'Etudes Spatiales. Process for altitude-stabilizing a balloon, and atmospheric balloons for implementing this process. 4,457,477, Cl. 244-97.000.

Reichle, Walter T., to Union Carbide Corporation. Catalysts for aldol condensations. 4,458,026, Cl. 502-80.000.

Reilly, Charles; Laub, Leonard; and Rose, Dennis, to Storage Technology Corporation. Apparatus for reading information stored in a track pattern on a radiation reflecting record. 4,458,144, Cl. 250-204.000.

Reinecke, Paul: *See—*
Schmitt, Hans-Georg; Paulus, Wilfried; Genth, Hermann; Brandes, Wilhelm; Reinecke, Paul; and Scheinpflug, Hans, 4,457,930, Cl. 424-248.500.

Reinehr, Ulrich; and Uhlemann, Hans, to Bayer Aktiengesellschaft. Continuous dry-spinning process for acrylonitrile filaments and fibres. 4,457,884, Cl. 264-168.000.

Reinehr, Ulrich; Bernklau, Kurt; Burghartz, Hans K.; Herbertz, Toni; and Jungverdorben, Hermann-Josef, to Bayer Aktiengesellschaft. Process for the production of dry-spun hollow polyacrylonitrile fibers and filaments. 4,457,885, Cl. 264-177.00F.

Reiner, Robert; and Schatter, Eckart, to Siemens Aktiengesellschaft. Photoelectric movement detector with varying amplitude light source. 4,458,146, Cl. 250-221.000.

Reiner, Roland; and Weiss, Urs, to Hoffmann-La Roche Inc. Acyl derivatives. 4,458,072, Cl. 544-22.000.

Reinhall, Rolf B. Apparatus for producing fiber pulp from fibrous lignocellulose containing material. 4,457,804, Cl. 162-254.000.

Remy, Joel, to Adret Electronique. Frequency synthesizer including a fractional multiplier. 4,458,329, Cl. 364-851.000.

Reneer, George: *See—*
Christoffel, Julius M., Jr.; and Reneer, George, 4,457,478, Cl. 244-155.00A.

Renner Manufacturing Company: *See—*
Voelz, Richard, 4,457,389, Cl. 180-140.000.

Renz, Udo D., to Daimler-Benz Aktiengesellschaft. Fastening arrangement for wheel covers. 4,457,559, Cl. 301-37.00P.

Research Corporation: *See—*
Miller, Ronald L., 4,457,865, Cl. 260-112.00R.

Reynolds, Roger G.; and Holtaway, Thomas S., to Weldex, Inc. Welding apparatus and control system therefor. 4,458,132, Cl. 219-114.000.

Rhythm Watch Co., Ltd.: *See—*
Takebe, Katsuhiko, 4,457,631, Cl. 368-273.000.

Rical S.A.: *See—*
Obadia, Jacques, 4,457,439, Cl. 215-256.000.

Richards, Raymond E. Membrane cooling system for metallurgical furnace. 4,458,351, Cl. 373-76.000.

Richert, Manfred, to Marker-Patentverwertungsgesellschaft mbH. Heelholder for safety ski binding. 4,457,534, Cl. 280-631.000.

Richter, Virgil J.: *See—*
Gangwisch, William J.; Richter, Virgil J.; Wixon, Harold E.; and Wraga, Joseph B., 4,457,854, Cl. 252-91.000.

Ricoh Company, Ltd.: *See—*
Tanikawa, Kiyoshi, 4,458,004, Cl. 430-270.000.

Ricord, Michael R. Cam lever compound bow. 4,457,288, Cl. 124-23.00R.

Rieter Machine Works Ltd.: *See—*
Binder, Rolf; Egloff, David; and Hanselmann, Daniel, 4,457,058, Cl. 29-125.000.

Rikagaku Kenkyusho: *See—*
Idesawa, Masanori; and Yatagai, Toyohiko, 4,457,626, Cl. 356-376.000.

Riley Stoker Corporation: *See—*
Itse, Daniel C.; and Penterson, Craig A., 4,457,241, Cl. 110-347.000.

Ringold, Howard J.; and Waterbury, L. David, to Syntex (U.S.A.) Inc. Use of pyrrolo-pyrrole in treating microvascular diseases associated with diabetes. 4,457,941, Cl. 424-274.000.

Risk, Daniel W. Hydraulic valve and control system. 4,457,211, Cl. 91-446.000.

Ritscher, James S.: *See—*
Garska, Daniel C.; and Ritscher, James S., 4,458,097, Cl. 585-415.000.

Rittal-Werk Rudolf Loh GmbH & Co. KG: *See—*
Laudt, Jurgen, 4,457,442, Cl. 220-18.000.
Wagener, Hans, 4,457,481, Cl. 248-68.100.

Rittenbach, Otto E.; and Olesch, Reinhard G., to United States of America, Army. Energy wave electronic intruder detection system. 4,458,240, Cl. 340-552.000.

Rittenhouse, Larry E.: *See—*
Ashbee, William H.; Beran, Mark A.; Colglazier, Donald F.; Janssen, Donovan M.; Mantey, John P.; Martin, Ronald J.; Patch, Gerald P.; Rittenhouse, Larry E.; and Valent, James A., 4,457,306, Cl. 271-3.100.

Robbins, David L.: *See—*
Molnar, Hugo; and Robbins, David L., 4,457,304, Cl. 128-204.250.

Robecchi, Edoardo; and Dell'Orto, Renato, to Industrie Pirelli S.p.A. Power transmission belt. 4,457,743, Cl. 474-260.000.

Robert Bosch GmbH: *See—*
Heitmann, Jurgen, 4,458,272, Cl. 360-8.000.
Horstmann, Winfried, 4,458,271, Cl. 358-310.000.
Lauterbach, Heinz; and Widera, Jorg, 4,457,169, Cl. 73-202.000.
Sumal, Jaihind S., 4,457,167, Cl. 73-118.000.

Roberts, Maurice P., to TRW Inc. Control apparatus. 4,457,132, Cl. 60-384.000.

Roberts, Thomas G.: *See—*
Holl, Herbert B.; Roberts, Thomas G.; and Barr, Thomas A., Jr., 4,458,350, Cl. 372-108.000.

Robertson, James A., to FMC Corporation. Recovery of phosphorus from sludge. 4,457,845, Cl. 210-651.000.

Robins, Ivan L.; and Starley, Lavoy. Ash and debris scoop. 4,457,548, Cl. 294-55.000.

Robinson, C. Sylvester, to Boeing Company, The. Apparatus and method for automatically testing a multiple node electrical circuit. 4,458,197, Cl. 324-73.0AT.

Robinson, Richard C., to Chevron Research Company. Combination catalytic reforming-isomerization process for upgrading naphtha. 4,457,832, Cl. 208-66.000.

Rocholl, Johan P.; and De Jong, Hendrikus, to Hunter Douglas International N.V. Process for lacquering articles & articles lacquered therewith. 4,457,965, Cl. 428-141.000.

Rockwell International Corporation: *See—*
Lange, Frederick F.; and Clarke, David R., 4,457,958, Cl. 427-314.000.
Perkins, William C., 4,458,236, Cl. 340-310.00R.

Rodler, Hans. Automatic infusion pump. 4,457,751, Cl. 604-66.000.

Rodun Development Corporation: *See—*
Dunegan, Ronald G., 4,457,517, Cl. 277-12.000.

Roe: Jin-Young K.: *See*—
Blasing, Elmer P.; Keeling, Ronald J.; and Roe: Jin-Young K., 4,458,062, Cl. 528-254.000.
Roehr, Oskar W. K. Warming garment for heating people. 4,457,295, Cl. 126-204.000.
Roenisch, Wolfgang; Klass, Joachim; Voigt, Hermann-Uwe; Hanisch, Ferdinand; van Hove, Cornelius; and Matzat, Horst, to Kabelmetal Electro GmbH. Cable protected against moisture and method of making the same. 4,458,105, Cl. 174-106.00D.
Roeschlau, Peter: *See*—
Jering, Helmut; Becker, Udo; and Roeschlau, Peter, 4,458,015, Cl. 435-13.000.
Rogers, Thomas E.; Jansson, Robert E.; and Baizer, Manuel M., to Monsanto Company. Electrolysis cells and electrolytic processes. 4,457,813, Cl. 204-74.000.
Rogov, Nikolai S.: *See*—
Chernikhov, Alexei Y.; Yakovlev, Mikhail N.; Rogov, Nikolai S.; Petrova, Aleftina P.; Martirosov, Eduard B.; and Gul, Valentin E., 4,458,041, Cl. 523-435.000.
Roman, Gianfranco, to Claber S.p.A. Swivel arm irrigator. 4,457,471, Cl. 239-242.000.
Roose, Lars D., to University of California, The Regents of the. Multilead heat sink. 4,457,360, Cl. 165-80.00B.
Rose, Dennis: *See*—
Reilly, Charles; Laub, Leonard; and Rose, Dennis, 4,458,144, Cl. 250-204.000.
Rosemount Inc.: *See*—
Kirkpatrick, William R., 4,458,137, Cl. 219-201.000.
Rosenheck, Leonard S.: *See*—
Herstein, Dov; and Rosenheck, Leonard S., 4,458,222, Cl. 333-26.000.
Rosinski, Edward J.: *See*—
Huang, Yun-Yang; and Rosinski, Edward J., 4,457,685, Cl. 425-461.000.
Ross, David P., to Westinghouse Electric Corp. Multiple fiber armatures for electromagnetic launchers. 4,457,205, Cl. 89-8.000.
Ross, Donald R. Apparatus and a process for heating a material. 4,457,703, Cl. 432-13.000.
Rosseau, Richard B.: *See*—
Erdman, Garard C.; Cottam, John L.; Cox, Leonard S.; and Rosseau, Richard B., 4,457,044, Cl. 15-348.000.
Rost, Kurt: *See*—
Dremmel, Engelbert, 4,457,216, Cl. 99-287.000.
Roth, Wolfgang; Fichtner, Karl-Heinz; and FeBler, Dieter, to Stator-mat-Globe Maschinenfabrik GmbH. Device for winding coils for electric motors. 4,457,347, Cl. 140-92.100.
Rother, Wolfgang: *See*—
Kreft, Wilfried; Rother, Wolfgang; Tiggesbaumker, Peter; Menzel, Karl; Schmelter, Herbert W.; and Weber, Heinrich, 4,457,082, Cl. 34-57.00E.
Rowe, Robert L.; and Christensen, Kenneth W., to General Motors Corporation; and Rowe, Robert L. Hubcap with improved retention structure. 4,457,560, Cl. 301-37.00P.
Rowland, Thomas J., to Ingersol-Rand Company. Pellet extrusion die. 4,457,686, Cl. 425-463.000.
Royse, Marion A., to Schlegel Corporation. Flush glass window assembly for automotive vehicle. 4,457,109, Cl. 49-374.000.
Rubin, Fred K.; Blarcom, David V.; and Fox, Daniel J., to Lever Brothers Company. Alkaline cleaning compositions non-corrosive toward aluminum surfaces. 4,457,322, Cl. 134-2.000.
Ruckle, Duane L.; and Duvall, David S., to United Technologies Corporation. Quench-cracked ceramic thermal barrier coatings. 4,457,948, Cl. 427-34.000.
Rudolf, Peter; Kovacs, Jenoe; Vaeth, Guenter; and Ohlinger, Manfred, to BASF Aktiengesellschaft. Acicular ferrimagnetic iron oxide and its preparation. 4,457,982, Cl. 428-403.000.
Ruge, Hans; and Wobken, Gerold, to Maschinenfabrik Klaus-Gerd Hoes GmbH & Co., KG. Tensioning device for endless chain. 4,457,564, Cl. 305-10.000.
Ruhrgas Aktiengesellschaft: *See*—
Sommers, Hans; Berg, Hans; and Jannemann, Theo, 4,457,704, Cl. 432-29.000.
Rulkens, Peter P. M.; Haasen, Nicolaas F.; and Plantema, Otto G., to Stamicarbon B.V. Process for the purification of ε-caprolactam. 4,457,807, Cl. 203-72.000.
Rumpel, Manfred, to Ford Motor Company. Independent rear wheel suspension with adjustable toe angle control during recession. 4,457,536, Cl. 280-663.000.
Rumyantsev, Vladimir G.: *See*—
Ivaschenko, Alexandr V.; Lazareva, Valentina T.; Prudnikova, Elena K.; Rumyantsev, Vladimir G.; Pljusnina, Tamara S.; Nefedov, Viktor A.; Blinov, Lev M.; Titov, Viktor V.; Sevostyanov, Vladimir P.; and Shoshin, Vadim M., 4,457,859, Cl. 252-299.610.
Ruprecht, Hermann: *See*—
Maier, Martin; and Ruprecht, Hermann, 4,457,127, Cl. 56-192.000.
Rush, William F.; and Huebler, James E., to Institute of Gas Technology. Multi-frequency photo-acoustic detector. 4,457,162, Cl. 73-24.000.
Russell, John X., to Apex Corporation. Method and apparatus for forming internal threads in tubes. 4,457,153, Cl. 72-125.000.
Ryeczek, John J. Earth battery. 4,457,988, Cl. 429-47.000.
Rylander, Nicholas M. Sphere launching apparatus. 4,457,037, Cl. 15-104.06A.
Rywalski, Heinrich: *See*—
Bohlander, Friedhelm; and Rywalski, Heinrich, 4,457,449, Cl. 220-445.000.
S.A.Y. Industries, Inc.: *See*—
Humphries, Romilly H., 4,457,426, Cl. 206-158.000.
S.N.E.C.M.A.: *See*—
Hallinger, Claude C., 4,457,668, Cl. 416-95.000.
Saalmueller, Karl-Heinz: *See*—
Kopp, Walter; and Saalmueller, Karl-Heinz, 4,457,613, Cl. 355-3.0DD.
SAB Automotive AB: *See*—
Andersson, Sten E. O.; and Nelander, Nils A., 4,457,337, Cl. 137-614.130.
Sado, Ichiro; and Kishimoto, Juji, to Canon Kabushiki Kaisha. Electronic device for displaying accents. 4,458,243, Cl. 340-756.000.
Safe Play Manufacturing Co., Inc.: *See*—
Easterday, Arthur M., 4,457,023, Cl. 2-18.000.
Sahatchieva, Maria A.: *See*—
Konstantinov, Ivan T.; Mednikarov, Borislav D.; Sahatchieva, Maria A.; and Burov, Atanas T., 4,458,008, Cl. 430-302.000.
St-Germain, Jean, to Airflite, Inc. Levitationarium for air flotation of humans. 4,457,509, Cl. 272-2.000.
Saint-Gobain Emballage: *See*—
Ducloux, Marcel L., 4,457,420, Cl. 198-369.000.
Saito, Hideya, to TDK Electronics Co., Ltd. Case combination for microcassette. 4,457,428, Cl. 206-232.000.
Saito, Toshihiko; and Hirasawa, Fusao, to Tokyo Shibaura Denki Kabushiki Kaisha. Pulse Burners. 4,457,690, Cl. 431-1.000.
Saito, Toshihiko: *See*—
Hisaoka, Satoshi; and Saito, Toshihiko, 4,457,691, Cl. 431-1.000.
Sakaguchi, Minoru: *See*—
Takeuti, Susumu; Sakaguchi, Minoru; Aoyama, Takanobu; and Oishi, Kazuaki, 4,458,099, Cl. 174-27.000.
Sakai, Shinji: *See*—
Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; Sakai, Shinji; Uchiyama, Takashi; and Momiyama, Kikuo, 4,457,612, Cl. 354-471.000.
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; Noda, Koshi; and Morihashi, Toshifumi, to Murata Kikai Kabushiki Kaisha. Air spinning nozzle unit. 4,457,130, Cl. 57-328.000.
Sakakibara, Toshimitsu: *See*—
Takawashi, Tamio; Sakakibara, Toshimitsu; and Yamada, Shigeo, 4,458,190, Cl. 318-603.000.
Sakamoto, Keiji; and Seki, Shinji, to Fanuc Ltd. A.C. Motor drive apparatus. 4,458,192, Cl. 318-798.000.
Sakane, Kazuo: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,457,928, Cl. 424-246.000.
Saleck, Wilhelm: *See*—
Weyde, Edith; Saleck, Wilhelm; Psaar, Hubertus; von Konig, Anita; and Ohlschlager, Hans, 4,458,009, Cl. 430-350.000.
Salman, Naif D.: *See*—
Motley, David M.; and Salman, Naif D., 4,458,355, Cl. 375-82.000.
Salomon, Georges P. J., to Etablissemnets Francois Salomon & Fils. Safety binding for ski. 4,457,533, Cl. 280-628.000.
Salzgeber, Daniel E., to Stanadyne, Inc. Cold temperature advance mechanism. 4,457,284, Cl. 123-502.000.
Samuels, Gerard, to RCA Corporation. Apparatus for spraying a liquid on a spinning surface. 4,457,259, Cl. 118-705.000.
Samuels, Michael W.: *See*—
Zasio, John J.; and Samuels, Michael W., 4,458,129, Cl. 219-68.000.
Sanden Corporation: *See*—
Hiraga, Masaharu, 4,457,676, Cl. 418-55.000.
Kawano, Akihiro; and Terauchi, Kiyoshi, 4,457,674, Cl. 418-5.000.
Sanders, Ian L.: *See*—
Kabelac, William J.; and Sanders, Ian L., 4,458,335, Cl. 365-8.000.
Sandmeier, Rudolf; and Schelling, Hanspeter, to Sandoz Ltd. Fungicidal N-substituted phenyl-N-(2-oxo-3-oxazolidinyl)-acetamide derivatives. 4,457,937, Cl. 424-272.000.
Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; Ishidoshiro, Hiroshi; Minakata, Matsuo; and Goto, Tokuju, 4,457,145, Cl. 68-5.00E.
Sando, Yoshikazu; Ishidoshiro, Hiroshi; Minakata, Matsuo; and Goto, Tokuju, to Sando Iron Works Co., Ltd. Apparatus for treating a textile product continuously with the use of low-temperature plasma. 4,457,145, Cl. 68-5.00E.
Sandoz Ltd.: *See*—
Mauric, Claudine; and Wolf, Rainer, 4,458,045, Cl. 524-119.000.
Sandmeier, Rudolf; and Schelling, Hanspeter, 4,457,937, Cl. 424-272.000.
Sanford, Robert J., to International Paper Company. Machine for erecting hexagonal drum. 4,457,744, Cl. 493-126.000.
Sanofi: *See*—
Bouscuet, Andre; and Heymes, Alain, 4,458,074, Cl. 546-114.000.
Chekroun, Isaac; and Heymes, Alain, 4,458,086, Cl. 549-74.000.
Santen Pharmaceutical Co., Ltd.: *See*—
Iwao, Junichi; Oya, Masayuki; Baba, Toshio; Iso, Tadashi; and Chiba, Takehisa, 4,457,935, Cl. 424-270.000.
Santilli, Donald S.: *See*—
Lee, Bowman; and Santilli, Donald S., 4,458,025, Cl. 502-66.000.
Sanyo Electric Co., Ltd.: *See*—
Shibata, Kenji; and Takahashi, Noboru, 4,457,698, Cl. 431-254.000.
Sapporo Breweries Ltd.: *See*—
Kawai, Kimitoshi; Sugawara, Kunio; and Morinaga, Tsuyoshi, 4,457,863, Cl. 260-112.00R.
Saran, Herbert, deceased (by Saran, Karin, nee Muller, executor); and Witthaus, Martin, to Henkel Kommanditgesellschaft auf Aktien. Method of making coated granular bleach activators by spray drying. 4,457,858, Cl. 252-182.000.

Saran, Karin, nee Muller, executor: *See—*
Saran, Herbert, deceased; and Witthaus, Martin, 4,457,858, Cl. 252-182.000.

Sartschev, Adam J.: *See—*
Booz, A. David; Barch, Daniel R.; Cebulak, Walter S.; Kapustay, John B., Jr.; and Sartschev, Adam J., 4,457,881, Cl. 264-12.000.

Sasano, Akira: *See—*
Takasaki, Yukio; Shimomoto, Yasuharu; Tanaka, Yasuo; Sasano, Akira; and Tsukada, Toshihisa, 4,457,949, Cl. 427-39.000.

Sato, Katsujiro: *See—*
Kodama, Hisashi; Sato, Katsujiro; Tamura, Tetsuomi; Hamamoto, Tooru; and Yamada, Kazuharu, 4,457,270, Cl. 123-90.580.

Sato, Nobuo: *See—*
Iwanaga, Shoichi; Sato, Nobuo; Ikegami, Akira; Isogai, Tokio; Noro, Takanobu; and Arima, Hideo, 4,457,161, Cl. 73-23.000.

Sato, Yoko: *See—*
Imamura, Yoshinobu; Ito, Hajime; Sato, Yoko; and Nakamori, Hiromichi, 4,457,945, Cl. 426-53.000.

Sattlegger, Hans; Schnurrbusch, Karl; and Metzinger, Hans-Gerd, to Bayer Aktiengesellschaft. Storable plastic organopolysiloxane molding compositions. 4,458,055, Cl. 525-477.000.

Saunders, Peter R.: *See—*
Lofquist, Robert A.; Twilley, Ian C.; and Saunders, Peter R., 4,458,053, Cl. 525-183.000.

Saunders, William T.; Austin, Lowell W.; Smith, John R.; and Bingle, William D., to National Steel Corporation. Method of forming D&I cans from coated steel. 4,457,150, Cl. 72-47.000.

Savoly, Arpad: *See—*
Papalos, John G.; Villa, Jose L.; Knitter, Kathy A.; and Savoly, Arpad, 4,457,762, Cl. 44-51.000.
Papalos, John G.; and Savoly, Arpad, 4,457,874, Cl. 260-512.00C.

Sawada, Takao: *See—*
Komine, Yoshiharu; and Sawada, Takao, 4,458,233, Cl. 338-34.000.

Sawaguchi, Takeo: *See—*
Nobutoki, Saburo; Ichikawa, Mitsuo; and Sawaguchi, Takeo, 4,457,732, Cl. 445-35.000.

Sawazaki, Masatoshi, to Precision Fukuhara Works, Ltd. Yarn feeding apparatus for circular knitting machines. 4,457,144, Cl. 66-132.00T.

Sawicki, Walter M. Composite photography apparatus and method. 4,457,599, Cl. 352-89.000.

Sawyer, Tomi K.: *See—*
Hruby, Victor J.; Hadley, Mac E.; Heward, Christopher B.; and Sawyer, Tomi K., 4,457,864, Cl. 260-112.50R.

Scala, John J. Platform for stairs. 4,457,397, Cl. 182-116.000.

Scaramuzzi, Rex J.: *See—*
Cox, Ronald I.; Hoskinson, Ronald M.; Scaramuzzi, Rex J.; Wilson, Patricia A.; and George, John M., 4,457,914, Cl. 424-88.000.

Schaller nee Kornmayer, Hildegard C.; and Bodenmuller, Heinz, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.v. Peptide, process for its preparation and pharmaceutical composition containing same. 4,457,917, Cl. 424-177.000.

Schaper, Ulf-Armin: *See—*
Conrad, Jens; Schaper, Ulf-Armin; and Zeidler, Ulrich, 4,457,944, Cl. 424-358.000.

Schatter, Eckart: *See—*
Reiner, Robert; and Schatter, Eckart, 4,458,146, Cl. 250-221.000.

Schatz, Hermann: *See—*
Diem, Hans; Fritsch, Robert; Lehnert, Heinz; Matthias, Guenther; Schatz, Hermann; and Wittmann, Otto, 4,458,049, Cl. 524-595.000.

Scheele, Wilfrid J.: *See—*
Craft, William K.; and Scheele, Wilfrid J., 4,457,054, Cl. 27-1.000.

Scheerhorn, Douglas, to Steelcase Inc. Lock arrangement for office furniture units. 4,457,569, Cl. 312-219.000.

Scheffer, Karl D. System and process for the abatement of casting pollution, reclaiming resin bonded sand, and/or recovering a low BTU fuel from castings. 4,457,352, Cl. 164-5.000.

Scheinpflug, Hans: *See—*
Schmitt, Hans-Georg; Paulus, Wilfried; Genth, Hermann; Brandes, Wilhelm; Reinecke, Paul; and Scheinpflug, Hans, 4,457,930, Cl. 424-248.500.

Scheler, Siegfried: *See—*
Thoese, Klaus; Frommeld, Hans-Dieter; and Scheler, Siegfried, 4,457,997, Cl. 430-160.000.

Schelling, Hanspeter: *See—*
Sandmeier, Rudolf; and Schelling, Hanspeter, 4,457,937, Cl. 424-272.000.

Schepper, Manfred, to Leifeld & Lemke Machinenfabrik GmbH & Co. KG. Barrel cleaning apparatus. 4,457,324, Cl. 134-102.000.

Schering, Aktiengesellschaft: *See—*
Biere, Helmut; Kapp, Joachim-Friedrich; and Bottcher, Irmgard, 4,457,927, Cl. 424-245.000.
Bittler, Dieter; Laurent, Henry; Nickisch, Klaus; and Wiechert, Rudolf, 4,457,925, Cl. 424-243.000.

Schett, Oskar; and Leemann, Richard, to Mettler Instruments AG. Temperature-corrected weighing apparatus having electromagnetic load compensation means. 4,457,386, Cl. 177-212.000.

Scheurich, John L.; and Nelson, Gary J., to FMC Corporation. Automated large caliber ammunition handling system. 4,457,209, Cl. 89-45.000.

Schimmel, Gunther; Gradl, Reinhard; and Heymer, Gero, to Hoechst Aktiengesellschaft. Process for after-treating extraction residues originating from the decontamination of phosphoric acid. 4,457,848, Cl. 210-724.000.

Schindler, Robert: *See—*
Huber, Manfred; and Schindler, Robert, 4,457,429, Cl. 206-394.000.

Schlegel Corporation: *See—*
Royse, Marion A., 4,457,109, Cl. 49-374.000.

Schleifer, Arthur: *See—*
Willis, Barry G.; Schleifer, Arthur; Bell, Norton W.; Dryden, Paul C.; Stefanski, Andrew; and Dorny, C. Nelson, 4,458,323, Cl. 364-582.000.

Schlinger, Robin: *See—*
Grotyohann, Richard G.; Johnston, Byron E.; and Schlinger, Robin, 4,457,899, Cl. 423-321.00S.

Schmelter, Herbert W.: *See—*
Kreft, Wilfried; Rother, Wolfgang; Tiggesbaumker, Peter; Menzel, Karl; Schmelter, Herbert W.; and Weber, Heinrich, 4,457,082, Cl. 34-57.00E.

Schmid, Daniel: *See—*
Leiher, Alfred J.; Schmid, Daniel; and Pierce, Myrl D., 4,457,117, Cl. 52-238.100.

Schmidt, Dieter; Buschor, Josef; and Spillner, Wayne K., to UI Group, Inc. Automatic cooking method. 4,457,947, Cl. 426-438.000.

Schmidt, Frank T.: *See—*
Wiant, Morris N.; and Schmidt, Frank T., 4,457,546, Cl. 293-102.000.

Schmidt, Robert: *See—*
Eue, Ludwig; Schmidt, Robert; and Dickore, Karlfried, 4,457,774, Cl. 71-93.000.

Schmidt, Wolfgang, to U.S. Philips Corporation. Microwave window assembly having cooling means. 4,458,223, Cl. 333-252.000.

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Schmitz, William E.: *See—*
Matty, Thomas C.; Whalen, Dennis E.; Schmitz, William E.; and DeTine, Pamela E., 4,458,185, Cl. 318-270.000.

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Schnur, Rodney C., to Pfizer Inc. Aldose reductase inhibiting 5-(2-alkoxy-3-substituted phenyl)hydantoins. 4,457,939, Cl. 424-273.00R.

Schnurrbusch, Karl: *See—*
Sattlegger, Hans; Schnurrbusch, Karl; and Metzinger, Hans-Gerd, 4,458,055, Cl. 525-477.000.

Schoenberg, Steve A.; Ellis, David G.; and Aronstein, Jesse, to Wright-Malta Corporation. Sound signal automatic detection and display method and system. 4,457,203, Cl. 84-454.000.

Scholey, Robert: *See—*
MacGregor, Ian K.; Scholey, Robert; and Spenceley, Gene D., 4,457,777, Cl. 75-51.000.

Scholz, Arthur, to BBC Brown, Boveri & Company, Limited. Non-destructive method and device for ultrasonic testing of the material of generator rotor teeth. 4,457,176, Cl. 73-624.000.

Schrader, Lothar: *See—*
Giebel, Burkhard; Moormann, Hans; and Schrader, Lothar, 4,458,338, Cl. 365-201.000.

Schrewe, Hans: *See—*
Gruner, Hans; Schrewe, Hans; Pleschiutschnigg, Fritz-Peter; and Parschat, Lothar, 4,458,155, Cl. 250-572.000.

Schroder, Rolf; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Regulating plant growth with novel 1-amino-cyclopropanecarboxylic acid metal complexes. 4,457,870, Cl. 260-429.00R.

Schroder, William J.; and Pittman, Edgar H., to Milliken Research Corporation. Slotted disc type yarn tension control. 4,457,129, Cl. 57-284.000.

Schroeder, Alfred C., to RCA Corporation. Sampling arrangement for a television ghost signal cancellation system. 4,458,269, Cl. 358-167.000.

Schure, Ralph M.; and Steele, Gerald H., to Eschem Inc. Stabilization of epoxy systems in non-flammable solvents. 4,457,800, Cl. 156-307.300.

Schutte, Evert H., to U.S. Philips Corporation. Video signal processing circuit for a color television receiver. 4,458,263, Cl. 358-30.000.

Schutten, Herman P.: *See—*
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,458,287, Cl. 361-103.000.

Schwartz, Edward: *See—*
Patrickson, David J.; Webster, John D.; and Schwartz, Edward, 4,457,731, Cl. 445-2.000.

Schwartz, Robert E.; Noble, Roger K.; and Keller, Michael R., to John Zink Company. Large capacity air-powered smokeless flare. 4,457,696, Cl. 431-202.000.

Schweitzer, Edmund O., Jr. Fault indicator having a remote test point at which fault occurrence is indicated by change in magnetic state. 4,458,198, Cl. 324-133.000.

Schwieters, Clarence R.: *See—*
Charlson, Paul M.; Estry, Richard H.; and Schwieters, Clarence R., 4,458,274, Cl. 360-75.000.

Scobie, William B., to Keystone International, Inc. High temperature valve and seat therefor. 4,457,490, Cl. 251-174.000.

Scodari, Nicholas F. Electric razor preshave composition. 4,457,912, Cl. 424-73.000.

Scott, Donald, to National Nuclear Corporation. Liquid metal cooled nuclear reactors. 4,457,890, Cl. 376-362.000.

Scott, George V., to Colgate-Palmolive Company. Stabilization of carrageenan-containing toothpaste. 4,457,908, Cl. 424-49.000.

Seanor, Donald A., to Xerox Corporation. Combined charge/cleaning brush for use in a xerographic copier. 4,457,615, Cl. 355-3.0CH.

Security Shutter Corp.: *See*—
Forquer, William F., 4,457,106, Cl. 49-158.000.

Seemuth, Paul D., to Ethyl Corporation. Diesel fuel cetane improver. 4,457,763, Cl. 44-57.000.

Seese, Mark A.: *See*—
Welsh, William A.; Seese, Mark A.; and Peters, Alan W., 4,458,023, Cl. 502-65.000.

Segawa, Joichiro: *See*—
Sekiyama, Kenichi; Mishima, Yasuhiro; Hiraiwa, Hisao; and Segawa, Joichiro, 4,457,547, Cl. 293-110.000.

Seher, Fred H.: *See*—
Gioia, Norman F.; and Seher, Fred H., 4,457,733, Cl. 445-36.000.

Seibert, Willard J.; and Hill, Wesley B., to United Technologies Corporation. Viscous damper with rotor centering means. 4,457,667, Cl. 415-174.000.

Seiler, Klaus D.; Stapel, Wilheim; and Droste, Gunter, to Durkoppewerke GmbH. Rotary-gripper counter-hook for double-lock-stitch sewing machines. 4,457,244, Cl. 112-184.000.

Seiver, Robert L.; Rebick, Charles; and Goetsch, Duane A., to Exxon Research and Engineering Company. Supported, non (metal-promoted) carbon-containing molybdenum sulfide catalysts for selective nitrogen removal. 4,457,836, Cl. 208-254.00H.

Seki, Shinji: *See*—
Sakamoto, Keiji; and Seki, Shinji, 4,458,192, Cl. 318-798.000.

Sekine, Jiro; Komatsuzaki, Hiroshi; Hara, Hiroshi; and Kameyama, Nobuyuki, to Fuji Photo Film Co., Ltd. Easy loading camera. 4,457,607, Cl. 354-203.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Honda, Seiichirou; Ogawara, Hiroshi; and Fukuda, Mutsumi, 4,457,782, Cl. 106-266.000.
Nishizaki, Tomoyoshi; Miyamoto, Minoru; Miyamoto, Kazuaki; Yoshida, Ken; Yamaji, Kathuhiko; and Nakata, Yasushi, 4,457,136, Cl. 62-48.000.

Sekiyama, Kenichi; Mishima, Yasuhiro; Hiraiwa, Hisao; and Segawa, Joichiro, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Asahi Glass Company, Ltd. Bumper reinforcement structure for vehicles. 4,457,547, Cl. 293-110.000.

Selman, W. Robertson, Jr., to Windgrabber Corporation, The. Apparatus and method for deriving energy from a moving gas stream. 4,457,666, Cl. 415-2.00R.

Seltzer, Donald S.: *See*—
Whitney, Daniel E.; and Seltzer, Donald S., 4,458,321, Cl. 364-513.000.

Selvi & C. S.p.A.: *See*—
Milani, Carlo; Carminati, Giovanni M.; and Sovera, Attilio, 4,457,931, Cl. 424-250.000.

Senor, Ronald E., to Texas Instruments Incorporated. Protector apparatus for dynamoelectric machines. 4,458,231, Cl. 337-107.000.

Sepulveda, Ralph R.; and Lander, Lynn H., to Lever Brothers Company. Pretreatment composition for stain removal. 4,457,857, Cl. 252-174.210.

Servimetal: *See*—
du Manoir de Juaye, Pierre; Guerit, Pierre; Pollet, Gilbert; and Vassiliadis, Marc, 4,457,496, Cl. 266-227.000.

Sevostyanov, Vladimir P.: *See*—
Ivaschenko, Alexandr V.; Lazareva, Valentina T.; Prudnikova, Elena K.; Rumyantsev, Vladimir G.; Pljusnina, Tamara S.; Nefedov, Viktor A.; Blinov, Lev M.; Titov, Viktor V.; Sevostyanov, Vladimir P.; and Shoshin, Vadim M., 4,457,859, Cl. 252-299.610.

Seymour-Sheridan, Inc.: *See*—
Morgan, David L., 4,457,213, Cl. 92-42.000.

Shaefer, Robert R.; and Matthews, Kenneth J., to Nibco Inc. Plastic pipe fitting. 4,457,542, Cl. 285-55.000.

Shah, Dilip C.: *See*—
Weymouth, William M.; and Shah, Dilip C., 4,458,357, Cl. 377-2.000.

Shah, Hasmukh T.: *See*—
Brown, Gregory J.; Smith, Meredith E., Jr.; Shah, Hasmukh T.; and Beadles, Cecil D., deceased, 4,457,434, Cl. 209-539.000.

Shamie, Louis; and Shamie, Sam. Folding tricycle. 4,457,529, Cl. 280-278.000.

Shamie, Sam: *See*—
Shamie, Louis; and Shamie, Sam, 4,457,529, Cl. 280-278.000.

Shanks, Thomas P.; and Price, Robert P., to Hudson Oxygen Therapy Sales Company. Water trap assembly. 4,457,305, Cl. 128-205.120.

Sharber, Jerry L., to Sheller-Globe Corporation. Calendar holder. 4,457,088, Cl. 40-120.000.

Sharkey, John J.: *See*—
Kaufman, Peter; Sharkey, John J.; and Echols, John, 4,458,173, Cl. 310-338.000.

Sharon Manufacturing Company: *See*—
Hudson, Sharon J., Jr., 4,457,280, Cl. 123-470.000.

Sharp, Bernard C.; and Evans, Raymond J., to Parker-Hannifin Corporation. Attachable antiglare rear view mirror. 4,457,586, Cl. 350-281.000.

Sharp, Donald L., to Transamerica DeLaval Inc. Check valve with relief-valve feature. 4,457,333, Cl. 137-454.200.

Sharp Kabushiki Kaisha: *See*—
Horigome, Koichi; Okada, Seizo; Nishimura, Katsuji; and Yamamoto, Hachizou, 4,458,317, Cl. 364-406.000.
Yasukawa, Yozo, 4,457,588, Cl. 350-336.000.

Sharples, Thomas D., to Beckman Instruments, Inc. Small diameter shaft connection. 4,457,737, Cl. 464-99.000.

Shell Internationale Research Maatschappij B.V.: *See*—
Van't Sant, Jan P.; and Nieuwhof, Arjen, 4,457,776, Cl. 75-6.000.

Shell Oil Company: *See*—
Grimsby, Frank N., 4,457,869, Cl. 260-412.400.

Sheller-Globe Corporation: *See*—
Sharber, Jerry L., 4,457,088, Cl. 40-120.000.

Shepard, John K.; and Wagonseller, Walter R., to Continental Fibre Drum, Inc. Gas and liquid tight corner structure for a fibre shipping container. 4,457,465, Cl. 229-5.600.

Shepherd, John V.; and Thornley, John S., to Esselte Pendaflex Corp. Photosensitive materials for use in making dry transfers. 4,458,003, Cl. 430-253.000.

Sherrill, Jimmy L.: *See*—
Howard, H. Keith; and Sherrill, Jimmy L., 4,458,141, Cl. 219-532.000.

Sherwin, Martin B., to W. R. Grace & Co. Process for forming nitroparaffin. 4,458,094, Cl. 568-947.000.

Sherwin-Williams Company, The: *See*—
Grivas, John C.; and Park, Myong-Gi A., 4,457,806, Cl. 203-9.000.

Shiba, Haruo: *See*—
Okamura, Masatoshi; and Shiba, Haruo, 4,457,474, Cl. 242-199.000.

Shiba, Masataka; and Oshida, Yoshitada, to Hitachi, Ltd. Reflection type optical focusing apparatus. 4,458,302, Cl. 362-303.000.

Shibata, Akira, to Chugai Denki Kogyo Kabushiki-Kaisha. Internal oxidation method of Ag alloys. 4,457,787, Cl. 148-13.100.

Shibata, Kenji; and Takahashi, Noboru, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Oil burner. 4,457,698, Cl. 431-254.000.

Shibuya, Yoshiyuki: *See*—
Okamura, Kazuo; Tamura, Kohji; Daimon, Shigeo; and Shibuya, Yoshiyuki, 4,457,955, Cl. 427-127.000.

Shimabukuro, Hajime; Watanabe, Shuichi; Katayama, Shitomi; and Ohno, Akira, to NHK Spring Co., Ltd. Reflector and method for manufacturing the same. 4,457,598, Cl. 350-288.000.

Shimabukuro, Hajime: *See*—
Katayama, Shitomi; Shimabukuro, Hajime; Nomura, Suguru; Kurita, Hiroyuki; and Ohno, Akira, 4,457,587, Cl. 350-288.000.

Shimamoto, Susumu: *See*—
Ando, Toshinari; Nishi, Masataka; Takahashi, Yoshikazu; and Shimamoto, Susumu, 4,458,106, Cl. 174-126.00S.

Shimamune, Takayuki: *See*—
Asano, Hiroshi; Shimamune, Takayuki; and Goto, Toshiki, 4,457,822, Cl. 204-252.000.

Shimba, Satoru: *See*—
Ito, Kenji; Shimba, Satoru; Tsuda, Yasuo; and Sugita, Hiroshi, 4,458,012, Cl. 430-549.000.

Shimizu, Masami, to Canon Kabushiki Kaisha. Magnetic device. 4,458,230, Cl. 335-271.000.

Shimomoto, Yasuharu: *See*—
Takasaki, Yukio; Shimomoto, Yasuharu; Tanaka, Yasuo; Sasano, Akira; and Tsukada, Toshihisa, 4,457,949, Cl. 427-39.000.

Shin-Shirasuna Electric Corp.: *See*—
Otala, Matti N., 4,458,284, Cl. 361-79.000.

Shiokama, Yoshiharu: *See*—
Tomino, Naoki; Kimura, Makoto; Magariyama, Kenichi; and Shiokama, Yoshiharu, 4,457,609, Cl. 354-286.000.

Shiono, Kazuo, to Olympus Optical Company, Ltd. Fluid pipetting method. 4,457,184, Cl. 73-864.110.

Shipp, Kenneth O., Jr.: *See*—
Horn, Gary R.; and Shipp, Kenneth O., Jr., 4,457,638, Cl. 400-279.000.

Shiraishi, Hideo: *See*—
Hosokai, Tetsushi; Doinaga, Hajime; and Shiraishi, Hideo, 4,457,275, Cl. 123-339.000.

Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, to Canon Kabushiki Kaisha. Ink jet recording apparatus. 4,458,256, Cl. 346-140.00R.

Shoda, Mikio: *See*—
Ogami, Nobutoshi; Takada, Takeshi; Shoda, Mikio; and Kurata, Yasuhiro, 4,457,419, Cl. 198-345.000.

Shomura, Eiichi: *See*—
Hanyu, Susumu; Inamori, Mikio; and Shomura, Eiichi, 4,457,246, Cl. 112-266.100.

Shoshin, Vadim M.: *See*—
Ivaschenko, Alexandr V.; Lazareva, Valentina T.; Prudnikova, Elena K.; Rumyantsev, Vladimir G.; Pljusnina, Tamara S.; Nefedov, Viktor A.; Blinov, Lev M.; Titov, Viktor V.; Sevostyanov, Vladimir P.; and Shoshin, Vadim M., 4,457,859, Cl. 252-299.610.

Shu, Paul: *See*—
Yan, Tsoung-Yuan; and Shu, Paul, 4,458,033, Cl. 521-26.000.

Sidebottom, Ronald: *See*—
Evans, Edwin L.; Sidebottom, Ronald; Price, David W.; and Bonafont, Roger L., 4,458,043, Cl. 524-66.000.

Siemens AG: *See*—
Ramsey, S. David, Jr.; and Taenzer, Jon C., 4,457,175, Cl. 73-606.000.

Siemens Aktiengesellschaft: *See*—
Giebel, Burkhard; Moormann, Hans; and Schrader, Lothar, 4,458,338, Cl. 365-201.000.

Henkel, Hans-Joachim; and Muller, Norbert, 4,458,044, Cl. 524-100.000.
Klement, Ekkehard; and Wittmann, Julius, 4,457,467, Cl. 228-103.000.
Kopp, Walter; and Saalmueller, Karl-Heinz, 4,457,613, Cl. 355-3.0DD.
Kriedt, Hans; and Dietze, Andreas, 4,458,211, Cl. 330-257.000.
Mayr, Ernst; and Oestreich, Ulrich, 4,457,583, Cl. 350-96.230.
Reiner, Robert; and Schatter, Eckart, 4,458,146, Cl. 250-221.000.
Sklebitz, Hartmut; and Maass, Wolfgang, 4,458,359, Cl. 378-22.000.
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Siemens-Allis, Inc.: *See*—
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Siemens Corporation: *See*—
Mueller-Schloer, Christian, 4,458,109, Cl. 178-22.110.

Sig Schweizerische Industrie-Gesellschaft: *See*—
Fluck, Rene, 4,457,665, Cl. 414-786.000.

Siltec Corporation: *See*—
Bonora, Anthony C., 4,458,152, Cl. 250-353.000.

Simmen, Christian, to Heberlein Maschinenfabrik AG. Improvements relating to the moistening and subsequent texturing of textile yarns. 4,457,034, Cl. 8-151.200.

Simon, Lionel N.; Giner-Sorolla, Alfredo; and Guttag, Alvin, to Newport Pharmaceutical International, Inc.; and Sloan-Kettering Institute. Method of imparting immunomodulating, antiviral or antitumor activity. 4,457,919, Cl. 424-180.000.

Simpson, Richard O.: *See*—
Clements, Silous F.; Motola, Patrick D.; Simpson, Richard O.; and Swift, Shirley F., 4,458,311, Cl. 364-200.000.

Singer Company, The: *See*—
Eserhaut, Eldon D.; Gutridge, Donald E.; McNally, Ray F.; and Stumpf, Adolph P., 4,457,716, Cl. 434-43.000.
Jones, John E.; and Glenn, William K., III, 4,457,042, Cl. 15-322.000.
Odermann, Charles R., 4,457,245, Cl. 112-221.000.

Skaletz, Detlef H., to Hoechst Aktiengesellschaft. 4,4'-Diphenyl etherdialdehyde-bis-dimethylacetal and a process for its preparation. 4,457,810, Cl. 204-59.00R.

SKF Kugellagerfabriken GmbH: *See*—
Ernst, Horst M.; Brandenstein, Manfred; and Walter, Lothar, 4,457,395, Cl. 180-254.000.
Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, 4,457,740, Cl. 474-112.000.

Sklebitz, Hartmut; and Maass, Wolfgang, to Siemens Aktiengesellschaft. X-Ray diagnostic installation for X-ray tomographic images. 4,458,359, Cl. 378-22.000.

Sley, George S., to Helzer, Charles W. Magnesium phosphate fluid fertilizer. 4,457,773, Cl. 71-33.000.

Slicker, James M.: *See*—
Geppert, Steven; and Slicker, James M., 4,458,194, Cl. 318-811.000.

Sliger, Richard, to Precision Cosmet Co., Inc. Method and apparatus for marking contact lenses. 4,457,761, Cl. 8-507.000.

Sloan-Kettering Institute: *See*—
Simon, Lionel N.; Giner-Sorolla, Alfredo; and Guttag, Alvin, 4,457,919, Cl. 424-180.000.

Smay, Gary L.: *See*—
Novak, John H.; and Smay, Gary L., 4,457,957, Cl. 427-226.000.

Smiley, Harry; and Blechman, Abraham, to Medical Magnetics, Inc. Integrated oral magnetic osteogenic and orthodontic appliances. 4,457,707, Cl. 433-18.000.

Smit, Geoffrey N.; Anderson, Scott R.; and Tsai, Shan-Chin, to Borg-Warner Corporation. Control arrangement for a variable pulley transmission. 4,458,318, Cl. 364-424.100.

Smith, Bruce A., to International Business Machines Corporation. Dot matrix character printing using constrained memory. 4,458,333, Cl. 364-900.000.

Smith, Donald R. Material dispenser apparatus. 4,457,641, Cl. 401-135.000.

Smith International, Inc.: *See*—
Layton, Larry H., 4,457,384, Cl. 175-318.000.

Smith, James H.: *See*—
Mui, Paul K.; Smith, James H.; Woodard, Charles C.; and Albrecht, Laurence J., 4,458,282, Cl. 360-133.000.

Smith, John M.: *See*—
Swyer, Paul R.; Heim, Tibor; and Smith, John M., 4,457,310, Cl. 128-706.000.

Smith, John R.; Bingle, William D.; and Austin, Lowell W., to National Steel Corporation. Nickel-zinc alloy coated drawn and ironed can. 4,457,450, Cl. 220-455.000.

Smith, John R.: *See*—
Saunders, William T.; Austin, Lowell W.; Smith, John R.; and Bingle, William D., 4,457,150, Cl. 72-47.000.

Smith, Meredith E., Jr.: *See*—
Brown, Gregory J.; Smith, Meredith E., Jr.; Shah, Hasmukh T.; and Beadles, Cecil D., deceased, 4,457,434, Cl. 209-539.000.

Smiths Industries Public Limited Company: *See*—
Thrift, Peter R.; and Jacob, Neil R., 4,457,170, Cl. 73-304.00C.

Smithwick Lures, Inc.: *See*—
Wasson, John J., 4,457,096, Cl. 43-42.420.

SMS Schloemann-Siemag AG: *See*—
Meurer, Heinz, 4,457,353, Cl. 164-426.000.

SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Svagr, Alexandr, 4,457,152, Cl. 72-78.000.

Snetting, Mark E.: *See*—
Carlson, Alfred D.; Haub, Donald J.; and Snetting, Mark E., 4,457,036, Cl. 15-49.00R.

Snooks, Rupert J., Jr.: *See*—
Howse, Paul T., Jr.; Beasley, Byron E.; Jacques, M. Allan; and Snooks, Rupert J., Jr., 4,457,883, Cl. 264-168.000.

Snow, Thomas M.; and Muslin, Bernard J., to Liquid Tight Corporation. Connector for flexible electrical conduit. 4,457,544, Cl. 285-251.000.

Snyder, Richard H.: *See*—
Werley, Barry L.; Snyder, Richard H.; McQuillen, Joseph E.; and Miller, Keith A., 4,457,329, Cl. 137-73.000.

Sobczak, Isidore F.; Cleveland, William C., Jr.; and Pons, Robert L., to Ford Aerospace & Communications Corp. Modular solar concentrator. 4,457,297, Cl. 126-424.000.

Sobolewski, George, to Urban Transportation Development Corporation Ltd. Railway truck; pivotal connection. 4,457,238, Cl. 105-168.000.

Sohval, A. Robert; Cooperstein, Gerald; Fleischer, David; Goldstein, Shyke A.; and Hearn, David R., to Elscint Ltd. Plasma electron source for cold-cathode discharge device or the like. 4,458,180, Cl. 315-111.810.

Solheim, Allan D. Interlocking stackable tray. 4,457,432, Cl. 206-503.000.

Solomon, Paul M.; and Wiedmann, Siegfried K., to International Business Machines Corporation. TTL Logic gate. 4,458,162, Cl. 307-456.000.

Sommers, Hans; Berg, Hans; and Jannemann, Theo, to Ruhrgas Aktiengesellschaft. Method for the operation of a gas burner exposed to an air current as well as burners to implement the method. 4,457,704, Cl. 432-29.000.

Sondreal, John W.: *See*—
Horibata, Hiroshi; Sondreal, John W.; and Chu, Henry, 4,457,084, Cl. 36-7.800.

Sonntag, Siegfried: *See*—
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Sony Corporation: *See*—
Abe, Miki, 4,458,208, Cl. 330-10.000.
Ichikawa, Iwao, 4,457,451, Cl. 221-190.000.
Kuno, Osamu; and Takamiya, Tooru, 4,458,270, Cl. 358-225.000.
Quan, Ronald, 4,458,213, Cl. 330-267.000.

Soos, George: *See*—
Darling, Stewart A.; Kostanecki, Tadeusz; and Soos, George, 4,457,430, Cl. 206-459.000.

Sorenson, Paul D.; and Dickson, Dale A., to Medtronic, Inc. Ultrasound imaging system for scanning the human back. 4,457,311, Cl. 128-660.000.

South African Inventions Development Corporation: *See*—
Coetzer, Johan, 4,457,989, Cl. 429-102.000.

Southern Railway Company: *See*—
Parks, Jack E.; and Blanchfield, John H., 4,457,060, Cl. 29-239.000.

Sovera, Attilio: *See*—
Milani, Carlo; Carminati, Giovanni M.; and Sovera, Attilio, 4,457,931, Cl. 424-250.000.

Spector, George: *See*—
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Spellman, Gordon B.: *See*—
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,458,287, Cl. 361-103.000.

Spenceley, Gene D.: *See*—
MacGregor, Ian K.; Scholey, Robert; and Spenceley, Gene D., 4,457,777, Cl. 75-51.000.

Sperry Corporation: *See*—
Josephs, Richard M.; and Wang, Tsing-Chow, 4,458,160, Cl. 307-306.000.

Spevak, Richard P.: *See*—
Lattin, Gary A.; and Spevak, Richard P., 4,457,748, Cl. 604-20.000.

Spillner, Wayne K.: *See*—
Schmidt, Dieter; Buschor, Josef; and Spillner, Wayne K., 4,457,947, Cl. 426-438.000.

Spinato, Cesare. Grape crusher. 4,457,223, Cl. 99-510.000.

Spiniello Construction Company: *See*—
Donnelly, Frank, 4,457,326, Cl. 137-59.000.

Spinner, Jonathon: *See*—
Mitchell, Sharon J.; and Spinner, Jonathon, 4,457,856, Cl. 252-166.000.

Spong, Gary W., to Banstron Research Corp., Inc. Reading pacer. 4,457,720, Cl. 434-179.000.

Sprague Electric Company: *See*—
Bailey, Charles H.; and Cote, Richard E., 4,457,573, Cl. 339-128.000.
Mayrand, James F., 4,458,158, Cl. 307-270.000.

Sprengel, Heide: *See*—
Geissler, Ulrich; Sprengel, Heide; Herwig, Walter; and Hasenjaeger, Manfred, 4,458,007, Cl. 430-284.000.

Springs Industries, Inc.: *See*—
Daniels, John Y.; and Stevenson, James C., 4,457,980, Cl. 428-196.000.

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Peerlkamp, Erik R., 4,457,729, Cl. 441-74.000.
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Moen, Alfred M., 4,457,342, Cl. 137-801.000.
Salzgeber, Daniel E., 4,457,284, Cl. 123-502.000.
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Johnson, Lloyd D.; and Raudat, John L., 4,457,121, Cl. 53-56.000.
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Hoekstra, George R.; and Forgac, John M., 4,457,374, Cl. 166-251.000.
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Lautzenhiser, Theodore V.; and Wirtz, Jimmy D., 4,457,168, Cl. 73-151.000.
Lautzenhiser, Theodore V., 4,458,340, Cl. 367-32.000.
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Donohue, John A., 4,457,814, Cl. 204-75.000.
Standard Oil Company (Sohio), The: *See*—
Hardman, Harley F.; Frye, John G., Jr.; and Mazanec, Terry J., 4,458,088, Cl. 560-96.000.
Stangel, John J.: *See*—
Valentino, Pasquale A.; and Stangel, John J., 4,458,249, Cl. 343-754.000.
Stanley, Robert W.; Monette, Serge; and Harris, Bryn, to Noranda Mines Limited. Process for the selective dissolution of cobalt from cobaltite-pyrite concentrates. 4,457,897, Cl. 423-141.000.
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Robins, Ivan L.; and Starley, Lavoy, 4,457,548, Cl. 294-55.000.
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Roth, Wolfgang; Fichtner, Karl-Heinz; and FeBler, Dieter, 4,457,347, Cl. 140-92.100.
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Fesman, Gerald, 4,458,036, Cl. 521-107.000.
Hardy, Thomas A.; and Jaffe, Fred, 4,458,035, Cl. 521-107.000.
Nagubandi, Sreeramulu, 4,457,873, Cl. 260-502.50F.
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Scheerhorn, Douglas, 4,457,569, Cl. 312-219.000.
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Schure, Ralph M.; and Steele, Gerald H., 4,457,800, Cl. 156-307.300.
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Willis, Barry G.; Schleifer, Arthur; Bell, Norton W.; Dryden, Paul C.; Stefanski, Andrew; and Dorny, C. Nelson, 4,458,323, Cl. 364-582.000.
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Stern, Eric W.: *See*—
Amundsen, Alan R.; and Stern, Eric W., 4,457,926, Cl. 424-245.000.
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Stevenson, Richard F. Fishing line holder. 4,457,095, Cl. 43-25.200.
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Stillwell, William T. Bone cutting device for total knee replacement. 4,457,307, Cl. 128-317.000.
Stoll, Kurt. Conveyor system. 4,457,423, Cl. 198-619.000.
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Storage Technology Corporation: *See*—
Reilly, Charles; Laub, Leonard; and Rose, Dennis, 4,458,144, Cl. 250-304.000.
Storey, David C. Combined bridge and tailpiece assembly for a stringed musical instrument. 4,457,201, Cl. 84-313.000.
Stranko, Thomas A.; and Swann, Robert L., to International Business Machines Corporation. Rapid instruction redirection. 4,458,312, Cl. 364-200.000.
Strobel, Erwin J.: *See*—
Hubbard, Leo J.; Hubbard, Raymond P.; and Strobel, Erwin J., 4,457,463, Cl. 226-74.000.
Stroz, John J.; and Mackay, Donald A. M., to Nabisco Brands, Inc. Method of reducing dental caries. 4,457,921, Cl. 424-180.000.
Strupczewski, Joseph T., to Hoechst-Roussel Pharmaceuticals. 3-(4-Piperidinyl)-1,2-benzisothiazoles. 4,458,076, Cl. 546-199.000.
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Eserhaut, Eldon D.; Gutridge, Donald E.; McNally, Ray F.; and Stumpf, Adolph P., 4,457,716, Cl. 434-43.000.
Suchy, Adalbert W. Leveling device for power tools. 4,457,078, Cl. 33-334.000.
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Kirino, Hisao; Yabumoto, Yukinobu; Iritani, Takashi; Suga, Masao; Nakanishi, Yukinaga; and Itoh, Masaru, 4,457,819, Cl. 204-181.00R.
Sugawara, Kunio: *See*—
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Sugihara, Mayumi, to Tandy Corporation. Charging and discharging circuit. 4,458,111, Cl. 179-2.0BC.
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Marti, Kurt, 4,457,344, Cl. 139-192.000.
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Nakashima, Hiroyuki; Sumida, Morihiro; and Goto, Hiroki, 4,457,778, Cl. 75-51.000.
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Osada, Mitsuo; Kuroishi, Nobuhito; Amano, Yoshinari; and Fukui, Akira, 4,457,780, Cl. 75-236.000.
Sumitomo Gomu Kogyo Kabushiki Kaisha: *See*—
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Summers, James T., to Du Pont de Nemours, E. I., and Company. Bicomponent filament and process for making same. 4,457,974, Cl. 428-373.000.
Sun Tech, Inc.: *See*—
Vanderwerff, William D., 4,458,047, Cl. 524-476.000.
Super-Cut, Inc.: *See*—
Miller, Harold C., 4,457,113, Cl. 51-206.00R.
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Derby, Norwin C.; and Williamson, Robert R., 4,457,456, Cl. 222-105.000.
Supertex, Inc.: *See*—
Chao, Robert L., 4,458,262, Cl. 357-23.110.
Surgikos, Inc.: *See*—
Morris, Henrietta K., 4,457,026, Cl. 2-171.000.
Suter, Hans-Jorg; and Wild, Jurg, to Contraves AG. Drive device with two mutually counteracting motors for eliminating gearing backlash. 4,458,182, Cl. 318-113.000.
Sutton, Gordon R. Electronic calculating device. 4,458,320, Cl. 364-464.000.
Suzuki, Hiroo; Kuno, Tadashi; Yoshimura, Yasuo; Okugami, Kiyoshi; Hotta, Hisashi; and Otsuka, Shinya, to Toyo Ink Manufacturing Co.; and Toyo Seikan Kaisha Limited. Aqueous coating resin composition. 4,458,040, Cl. 523-412.000.
Suzuki, Hitoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Surface acoustic wave filter. 4,458,221, Cl. 333-196.000.
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Suzuki, Kunihiko, to Nissan Motor Company, Limited. Four-wheel drive system for automotive vehicle. 4,457,394, Cl. 180-247.000.
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Yoshida, Hitoshi; and Suzuki, Seiichi, 4,457,185, Cl. 74-336.00R.
Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; Sakai, Shinji; Uchiyama, Takashi; and Momiyama, Kikuo, to Canon Kabushiki Kaisha. Liquid crystal display device for camera. 4,457,612, Cl. 354-471.000.
Suzuki, Seigo; Eguchi, Seiji; and Moriya, Yoshiaki, to Tokyo Shibaura Electric Company, Ltd. Memory access control system. 4,458,313, Cl. 364-200.000.
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Svagr, Alexandr, to SMS Schloemann-Siemag Aktiengesellschaft. Apparatus for changing the tapered rolls of a skew rolling mill. 4,457,152, Cl. 72-78.000.
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Swan Corporation, The: *See*—
Moore, John W., 4,457,031, Cl. 4-614.000.
Swann, Robert L.: *See*—
Stranko, Thomas A.; and Swann, Robert L., 4,458,312, Cl. 364-200.000.
Swengel, Robert C., Jr.: *See*—
Davis, Wayne S.; and Swengel, Robert C., Jr., 4,457,575, Cl. 339-143.00R.
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Clements, Silous F.; Motola, Patrick D.; Simpson, Richard O.; and Swift, Shirley F., 4,458,311, Cl. 364-200.000.
Swyer, Paul R.; Heim, Tibor; and Smith, John M., to International Business Machines Corporation. Method and apparatus for determining the energy requirements of premature newborns. 4,457,310, Cl. 128-706.000.
Sygnator, Henry A., to Illinois Tool Works Inc. Tool gripping fastener. 4,457,654, Cl. 411-408.000.
Symmons Industries, Inc.: *See*—
Symmons, Paul C., 4,457,452, Cl. 222-20.000.
Symmons, Paul C., to Symmons Industries, Inc. Automatic shut-off valve. 4,457,452, Cl. 222-20.000.
Syntex (U.S.A.) Inc.: *See*—
Muchowski, Joseph M.; and Greenhouse, Robert, 4,458,081, Cl. 548-453.000.
Ringold, Howard J.; and Waterbury, L. David, 4,457,941, Cl. 424-274.000.
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Bar-Cohen, Yoseph; and Crane, Robert L., 4,457,174, Cl. 73-598.000.
Szabo, Antal: *See*—
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Tabaru, Kazunori; and Noda, Noriyuki, to Hitachi Metals, Ltd. Ferrite magnet and method of producing same. 4,457,851, Cl. 252-62.630.
Tabuchi, Hiroshi: *See*—
Oshima, Masanao; and Tabuchi, Hiroshi, 4,457,250, Cl. 114-265.000.
Taenzer, Jon C.: *See*—
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Tahara, Kyoko: *See*—
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Takada, Takeshi: *See*—
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Takahashi, Hayao: *See*—
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Takahashi, Susumu, to Kanto Yakin Kogyo Kabushiki Kaisha. Gas atmosphere heating furnace. 4,457,493, Cl. 266-81.000.
Takahashi, Toshikatsu; and Yayama, Kazuo, to Fuji Xerox Co., Ltd.; and Tokyo Optical Co., Ltd. Back focus controlling device in optical systems. 4,457,619, Cl. 355-60.000.
Takahashi, Yoshikazu: *See*—
Ando, Toshinari; Nishi, Masataka; Takahashi, Yoshikazu; and Shimamoto, Susumu, 4,458,106, Cl. 174-126.00S.
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Takasaki, Yukio; Shimomoto, Yasuharu; Tanaka, Yasuo; Sasano, Akira; and Tsukada, Toshihisa, to Hitachi, Ltd. Method of producing a photoelectric conversion layer. 4,457,949, Cl. 427-39.000.
Takashi, Nishida: *See*—
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Takata, Fumio, to Sumitomo Gomu Kogyo Kabushiki Kaisha. Floor pavement structure. 4,457,120, Cl. 52-309.400.
Takatori, Yasushi: *See*—
Shirato, Yoshiaki; Takatori, Yasushi; Hara, Toshitami; Nishimura, Yukuo; and Takahashi, Michiko, 4,458,256, Cl. 346-140.00R.
Takawashi, Tamio; Sakakibara, Toshimitsu; and Yamada, Shigeo, to Mitsubishi Denki Kabushiki Kaisha. Electric discharge machining control device. 4,458,190, Cl. 318-603.000.
Takayama, Ryoichi; and Ise, Yukihiko, to Matsushita Electric Industrial Co., Ltd. Ultrasonic transmitter-receiver. 4,458,170, Cl. 310-322.000.
Takebe, Katsuhiko, to Rhythm Watch Co., Ltd. Attenuation-modulation circuit for generating electronic bell sounds for a timepiece. 4,457,631, Cl. 368-273.000.
Takekawa, Hiroshi, to Olympus Optical Co. Ltd. Automated apparatus for photometrically detecting immunological agglutinating reactions. 4,457,893, Cl. 422-64.000.
Takemae, Yoshihiro, to Fujitsu Limited. Semiconductor memory circuit. 4,458,336, Cl. 365-149.000.
Takemae, Yoshihiro; Nozaki, Shigeki; Mezawa, Tsutomu; Kabashima, Katsuhiko; and Enomoto, Seiji, to Fujitsu Limited. Buffer circuit. 4,458,337, Cl. 365-189.000.
Takeno, Hidekazu: *See*—
Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; Hashimoto, Masashi; Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; and Imanaka, Hiroshi, 4,458,078, Cl. 548-227.000.
Takeshita, Isao; Yamamoto, Yoshiaki; and Tanaka, Hiroyoshi, to Matsushita Electric Industrial Co., Ltd. Absorption type heat pump device. 4,457,143, Cl. 62-476.000.
Takeuchi, Hiroshi; Ito, Yukio; Yamamoto, Etsuji; Jyomura, Shigeru; and Ashida, Sakichi, to Hitachi, Ltd. Ultrasonic probe. 4,458,172, Cl. 310-334.000.
Takeuchi, Sakazo; Ban, Kikuo; Inoue, Akira; and Otsuka, Hiromitsu, to Director-General of the Agency of Industrial Science and Technology. Wheelchair. 4,457,535, Cl. 280-650.000.
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Takeuti, Susumu; Sakaguchi, Minoru; Aoyama, Takanobu; and Oishi, Kazuaki, to Hitachi, Ltd. Three-phase combined type gas insulated electrical apparatus. 4,458,099, Cl. 174-27.000.
Takezawa, Kenichiro; Harada, Mineo; and Kako, Yutaka, to Hitachi, Ltd. Printer arm. 4,457,635, Cl. 400-124.000.
Takigawa, Tadahiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Processing method using a focused ion beam. 4,457,803, Cl. 156-626.000.
Takimoto, Masatami: *See*—
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Tamagawa, Tohoru: *See*—
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Tamaki, Hirohide; and Suzuki, Manabu, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Suspension device for motorcycle. 4,457,393, Cl. 180-227.000.
Tames, 509 Matador La. Oral rinse formulation and method of treating mouth and throat irritations therewith. 4,457,909, Cl. 424-55.000.
Tamura, Katsuhide; and Masaki, Yuichi, to Canon Kabushiki Kaisha. Electro-optic device with particular location of electrode crossovers. 4,457,589, Cl. 350-336.000.
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Tamura, Yasuyuki, to Canon Kabushiki Kaisha. Apparatus and method for reading multi-color original. 4,458,264, Cl. 358-75.000.
Tamura, Yoshiaki: *See*—
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Tanabe, Kenzo; and Nezu, Toshikazu, to Matsushita Electric Industrial Co., Ltd. AM Stereo Broadcasting system. 4,458,361, Cl. 381-15.000.
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Tanaka, Yasushi; and Moriya, Shigeru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Vehicle body floor construction of motor vehicles. 4,457,525, Cl. 280-5.00A.
Tanaka, Yasushi: *See*—
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Tanikawa, Kiyoshi, to Ricoh Company, Ltd. Optical information recording medium. 4,458,004, Cl. 430-270.000.

Taormina, Frank A.: *See*—
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Taormina, Umberto C. Tool holder. 4,457,462, Cl. 224-269.000.

Tarex Machines S.A.: *See*—
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Target Industries, Inc.: *See*—
Anthony, James W., 4,457,551, Cl. 296-65.00R.

Tasai, Masaaki: *See*—
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Tate, Clarence R., to Thalatta, Inc. Color changeable fabric. 4,457,723, Cl. 434-409.000.

Tatsumi, Hiroshi: *See*—
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Taylor, Dan E., to Atlantic Richfield Company, Electrical terminal for solar panel. 4,457,578, Cl. 339-263.00R.

Taylor, Henry D., to Vickers, Incorporated. Hydraulic steering system for full-track vehicles. 4,457,387, Cl. 180-6.480.

Taylor, James J.; and DiCinque, John, to Gilbert & Barker Manufacturing Co., Inc. Above-the-floor hydraulic lift. 4,457,401, Cl. 187-8.490.

Taylor, Lloyd D., to Polaroid Corporation. β-Eliminating polymers for diffusion control in photographic products. 4,458,001, Cl. 430-215.000.

Taylor, Robert M.; and Wiley, William C., to General Signal Corporation. Method and means for recalibrating electrochemical cells in situ. 4,457,808, Cl. 204-1.00T.

Taylor-Winfield Corporation, The: *See*—
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TDK Electronics Co., Ltd.: *See*—
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Teetz, Volker: *See*—
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Tehon, Stephen W.; and Monsay, Evelyn H., to General Electric Company. High dynamic compliance hydrophone with hydrostatic pressure balancing. 4,458,343, Cl. 367-149.000.

Tektronix, Inc.: *See*—
Jackson, Ronald M., 4,458,165, Cl. 307-595.000.

Teledyne Industries, Inc.: *See*—
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Telefonaktiebolaget L M Ericsson: *See*—
Filipsson, Hans A. V.; and Josefsson, Lars-Goran, 4,458,246, Cl. 343-7.600.
Svala, Carl G., 4,458,112, Cl. 179-18.0FA.
Thylen, Lars H., 4,457,579, Cl. 350-3.720.

Temple, Chester S.: *See*—
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Tennant Company: *See*—
Carlson, Alfred D.; Haub, Donald J.; and Snetting, Mark E., 4,457,036, Cl. 15-49.00R.

Tenney, David L.; Krause, James; and Welk, John R., to Motorola, Inc. Logic controlled degaussing system. 4,458,178, Cl. 315-8.000.

Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,457,928, Cl. 424-246.000.

Teramura, Mitsuyoshi; Takimoto, Masatami; Yasuda, Takeru; and Minoura, Mikio, to Toyota Jidosha Kabushiki Kaisha; and Aisan Industry Co., Ltd. Air-fuel ratio control device of a variable venturi-type carburetor. 4,457,279, Cl. 123-439.000.

Terauchi, Kiyoshi: *See*—
Kawano, Akihiro; and Terauchi, Kiyoshi, 4,457,674, Cl. 418-5.000.

Tesmann, Holger; and Kachel, Helmut, to Henkel Kommanditgesellschaft auf Aktien. Flotation aids and process for non-sulfidic minerals. 4,457,850, Cl. 252-61.000.

Texaco Inc.: *See*—
Doster, Martha S.; Nute, Alton J.; and Christopher, Charles A., 4,457,372, Cl. 166-274.000.
McCoy, David R.; McEntire, Edward E.; and Gipson, Robert M., 4,457,371, Cl. 166-267.000.

Texas Instruments Incorporated: *See*—
Dittakavi, Ashok; and Thompson, Barbara J., 4,457,719, Cl. 434-159.000.
Domogalla, John C., 4,458,237, Cl. 340-347.0AD.
Hall, James B., 4,458,334, Cl. 365-1.000.
Rao, G. R. Mohan; and Redwine, Donald J., 4,457,066, Cl. 29-571.000.
Senor, Ronald E., 4,458,231, Cl. 337-107.000.
Wason, Cameron B., 4,458,339, Cl. 367-14.000.
Wheeler, Glenn; and Piasinski, James F., 4,458,163, Cl. 307-466.000.

Thalatta, Inc.: *See*—
Tate, Clarence R., 4,457,723, Cl. 434-409.000.

Theurer, Josef; and Pichler, Johann, to Franz Plasser Bahnbaumaschinen Industrie Gesellschaft m.b.H. Track lifting and lining device. 4,457,234, Cl. 104-7.00B.

Theurer, Josef; Ganguly, Mihir; Bock, Gernot; and Praschl, Wilhelm, to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft mbH. Electronic anti-spin and anti-slip control for drive and brake of an intermittently advancing track working machine. 4,457,237, Cl. 105-61.000.

Thiers, Christiaan G.: *See*—
Janssens, Wilhelmus; Thiers, Christiaan G.; and Liekens, Wilfried F., 4,458,002, Cl. 430-236.000.

Thimsen, James A.: *See*—
Caspari, Richard B.; Whipple, Terry L.; and Thimsen, James A., 4,457,302, Cl. 128-133.000.

Thoese, Klaus; Frommeld, Hans-Dieter; and Scheler, Siegfried, to Hoechst Aktiengesellschaft. Two-component diazotype material. 4,457,997, Cl. 430-160.000.

Thomas, Chris L.: *See*—
Imsand, Bruce E.; Thomas, Chris L.; and Dorfmueller, David D., 4,458,330, Cl. 364-900.000.

Thomas, David H.: *See*—
Penneck, Richard J.; Thomas, David H.; and Cox, Allan J., 4,458,104, Cl. 174-88.00R.

Thomas, Dennis A.: *See*—
Donaldson, John M.; Vidosh, Donn E.; Karlson, Lars G.; and Thomas, Dennis A., 4,457,400, Cl. 182-234.000.

Thomas, Erwin: *See*—
Grosskinsky, Otto-Alfred; Frommer, Elmar; Rapp, Guenther; and Thomas, Erwin, 4,457,906, Cl. 423-387.000.

Thompson, Barbara J.: *See*—
Dittakavi, Ashok; and Thompson, Barbara J., 4,457,719, Cl. 434-159.000.

Thompson, James G. Trigger mechanism for a bolt action rifle. 4,457,094, Cl. 42-69.00A.

Thompson, James M.; and Denton, David L., to Eastman Kodak Company. Method of removal of paper wraps from cigarette filter rods. 4,457,317, Cl. 131-96.000.

Thompson, Richard B. Rebound ball game and apparatus therefor. 4,457,513, Cl. 273-411.000.

Thomson-CSF: *See*—
Favreau, Michel; and Marguinaud, Andre, 4,458,207, Cl. 329-136.000.
Forterre, Gerard; and Hartemann, Pierre, 4,457,464, Cl. 228-124.000.
Klausz, Remy, 4,458,358, Cl. 378-19.000.
Munch, Joseph, 4,458,354, Cl. 378-25.000.
Tournois, Pierre, 4,458,342, Cl. 367-88.000.

Thones, Gustav: *See*—
Premel, Ulrich; and Thones, Gustav, 4,457,361, Cl. 165-84.000.

THORN EMI plc: *See*—
Chapman, John M.; and Antonis, Basil, 4,458,301, Cl. 362-216.000.

Thornley, John S.: *See*—
Shepherd, John V.; and Thornley, John S., 4,458,003, Cl. 430-253.000.

Thrift, Peter R.; and Jacob, Neil R., to Smiths Industries Public Limited Company. Fluid-gauging probe assemblies and fluid tanks. 4,457,170, Cl. 73-304.00C.

Thule United Limited: *See*—
Bailey, Marshall G., 4,457,839, Cl. 209-234.000.

Thurston, John W. Multihull vessels. 4,457,248, Cl. 114-39.000.

Thylen, Lars H., to Telefonaktiebolaget L M Ericsson. Arrangement to reduce influence of diffuse and direct reflections in a display device based on a source of light emitting in a narrow band. 4,457,579, Cl. 350-3.720.

Tiggesbaumker, Peter: *See*—
Kreft, Wilfried; Rother, Wolfgang; Tiggesbaumker, Peter; Menzel, Karl; Schmelter, Herbert W.; and Weber, Heinrich, 4,457,082, Cl. 34-57.00E.

Timoshenko, Grigory M.; Kravets, Vladimir G.; Timoshenko, Vladimir G.; Zima, Petr F.; Astrakhan, Alexandr Z.; Overko, Valentin M.; Isadchenko, Vasily S.; Lenenko, Stanislav A.; Goldynsky, Gennady G.; Osmanian, Karo A.; Aralov, Evgeny G.; Maleev, Georgy V.; Kuzmich, Igor A.; Ekber, Boris Y.; and Kreschenko, Nikolai A. Pulse hydraulic monitor. 4,457,331, Cl. 137-119.000.

Timoshenko, Vladimir G.: *See*—
Timoshenko, Grigory M.; Kravets, Vladimir G.; Timoshenko, Vladimir G.; Zima, Petr F.; Astrakhan, Alexandr Z.; Overko, Valentin M.; Isadchenko, Vasily S.; Lenenko, Stanislav A.; Goldynsky, Gennady G.; Osmanian, Karo A.; Aralov, Evgeny G.; Maleev, Georgy V.; Kuzmich, Igor A.; Ekber, Boris Y.; and Kreschenko, Nikolai A., 4,457,331, Cl. 137-119.000.

Tissing, Steven: *See*—
Mason, Joe; Noble, Gerald; Eckert, Hermann; and Tissing, Steven, 4,457,795, Cl. 156-73.500.

Titov, Viktor V.: *See*—
Ivaschenko, Alexandr V.; Lazareva, Valentina T.; Prudnikova, Elena K.; Rumyantsev, Vladimir G.; Pljusnina, Tamara S.; Nefedov, Viktor A.; Blinov, Lev M.; Titov, Viktor V.; Sevostyanov, Vladimir P.; and Shoshin, Vadim M., 4,457,859, Cl. 252-299.610.

Toda, Gyozo: *See*—
Fujita, Tsuyoshi; Komatsu, Shinichi; and Toda, Gyozo, 4,457,950, Cl. 427-43.100.

Toda, Munetaka: *See*—
Masaki, Masaru; Ito, Yoshinori; Inoue, Akihiko; and Toda, Munetaka, 4,457,157, Cl. 72-354.000.

Todd, David B.; and Layfield, James D., to Baker Perkins Inc. Centrifugally powered pelletizing machine and method. 4,457,882, Cl. 264-25.000.

Todd, William H. High torque, low speed hydraulic motor. 4,457,677, Cl. 418-61.00B.

Toga, Yuzo: *See*—
Kanno, Tatsuya; and Toga, Yuzo, 4,458,063, Cl. 528-418.000.

Tokai Seiki Co., Ltd.: *See*—
Hattori, Tadamichi, 4,457,699, Cl. 431-344.000.

Tokai TRW & Co. Ltd.: *See—*
Abe, Michio; and Maeda, Naoyuki, 4,457,390, Cl. 180-142.000.
Tokuhara, Mitsuhiro, to Canon Kabushiki Kaisha. Variable magnification optical apparatus. 4,457,616, Cl. 355-8.000.
Tokyo Optical Co., Ltd.: *See—*
Takahashi, Toshikatsu; and Yayama, Kazuo, 4,457,619, Cl. 355-60.000.
Tokyo Sanyo Electric Co., Ltd.: *See—*
Shibata, Kenji; and Takahashi, Noboru, 4,457,698, Cl. 431-254.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Hashimoto, Tadashi; and Morita, Ken, 4,458,119, Cl. 200-145.000.
Hashimoto, Yoshiro; and Horino, Shigeo, 4,457,126, Cl. 53-528.000.
Hisaoka, Satoshi; and Saito, Toshihiko, 4,457,691, Cl. 431-1.000.
Iida, Takashi, 4,458,283, Cl. 361-76.000.
Ishikawa, Masaaki; and Iguchi, Michihisa, 4,457,507, Cl. 271-121.000.
Murakami, Reiji; Hashimoto, Shinichi; and Tamura, Yoshiaki, 4,457,257, Cl. 118-652.000.
Ohyama, Masumi, 4,458,235, Cl. 382-1.000.
Saito, Toshihiko; and Hirasawa, Fusao, 4,457,690, Cl. 431-1.000.
Suzuki, Hitoshi, 4,458,221, Cl. 333-196.000.
Takigawa, Tadahiro, 4,457,803, Cl. 156-626.000.
Wada, Hiroto; and Fujiwara, Shigeru, 4,458,161, Cl. 307-400.000.
Wagatsuma, Yuji, 4,458,136, Cl. 219-137.00R.
Watanabe, Yoshikuni, 4,457,671, Cl. 417-312.000.
Yanabu, Satoru; Tamagawa, Tohoru; Kaneko, Eiji; and Funahashi, Takumi, 4,458,121, Cl. 200-148.00R.
Tokyo Shibaura Electric Company, Ltd.: *See—*
Suzuki, Seigo; Eguchi, Seiji; and Moriya, Yoshiaki, 4,458,313, Cl. 364-200.000.
Tolanda, Milan, to Vitkovice, Unicovske strojirny koncernovy podnik. Device for supporting and guiding a working tool. 4,457,382, Cl. 173-22.000.
Tolman, Jay A., to A.P.C. Industries, Inc. Conductor pair identifier apparatus. 4,458,113, Cl. 179-175.30A.
Tolmie, Robert J., Jr., to Pitney Bowes Inc. Electrostatic copier having a control system for preventing jams. 4,457,617, Cl. 355-13.000.
Tombrello, Thomas A.: *See—*
Griffith, Joseph E.; Qiu, Yuanxun; and Tombrello, Thomas A., 4,457,972, Cl. 428-334.000.
Tominaga, Tsunekichi: *See—*
Yanagihara, Toshio; and Tominaga, Tsunekichi, 4,457,802, Cl. 156-405.100.
Tomino, Naoki; Kimura, Makoto; Magariyama, Kenichi; and Shiokama, Yoshiharu, to Nippon Kogaku K.K. Device for coupling a lens barrel and a camera body. 4,457,609, Cl. 354-286.000.
Tomioka, Kenichi: *See—*
Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; Tomioka, Kenichi; and Numasaki, Yoso, 4,457,872, Cl. 260-465.00D.
Tomson, James M.; and Bohde, Richard C., to General Electric Company. Methods and apparatus for pumping compressible dynamoelectric machine lubricant material. 4,457,670, Cl. 417-53.000.
Tomy Kogyo Co., Inc.: *See—*
Kozuka, Michihiro; and Tonokura, Masayuki, 4,457,099, Cl. 446-437.000.
Tsuzuki, Akio, 4,457,098, Cl. 446-435.000.
Tonokura, Masayuki: *See—*
Kozuka, Michihiro; and Tonokura, Masayuki, 4,457,099, Cl. 446-437.000.
Torpe, Wolfgang G.: *See—*
Hockele, Max; Torpe, Wolfgang G.; and Beham, Karl, 4,457,063, Cl. 29-520.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Ogawa, Akira; and Iida, Yasuyuki, 4,457,217, Cl. 99-295.000.
Toulios, Peter P.; and Hartman, Kenneth D., to Ares, Inc. Microwave-type projectile communication apparatus for guns. 4,457,206, Cl. 89-14.00R.
Tournois, Pierre, to Thomson-CSF. Diversified transmission multichannel detection system. 4,458,342, Cl. 367-88.000.
Townsend, Peter, to Metex Corporation. Pile driver cushion. 4,457,499, Cl. 267-137.000.
Toy, William W., to Bell Telephone Laboratories, Incorporated. Carrier recovery circuit. 4,458,356, Cl. 375-120.000.
Toyo Ink Manufacturing Co.: *See—*
Suzuki, Hiroo; Kuno, Tadashi; Yoshimura, Yasuo; Okugami, Kiyoshi; Hotta, Hisashi; and Otsuka, Shinya, 4,458,040, Cl. 523-412.000.
Toyo Kogyo Co., Ltd.: *See—*
Hosokai, Tetsushi; Doinaga, Hajime; and Shiraishi, Hideo, 4,457,275, Cl. 123-339.000.
Ueda, Tadakazu; and Tutumi, Kazumichi, 4,457,276, Cl. 123-339.000.
Toyo Seikan Kaisha Limited: *See—*
Suzuki, Hiroo; Kuno, Tadashi; Yoshimura, Yasuo; Okugami, Kiyoshi; Hotta, Hisashi; and Otsuka, Shinya, 4,458,040, Cl. 523-412.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Donomoto, Tadashi; Koyama, Motoisugu; Miyake, Joji; and Fuwa, Yoshio, 4,457,979, Cl. 428-614.000.
Kobayashi, Nobuyuki; and Ito, Toshimitsu, 4,457,283, Cl. 123-492.000.
Kodama, Hisashi; Sato, Katsujiro; Tamura, Tetsuomi; Hamamoto, Tooru; and Yamada, Kazuharu, 4,457,270, Cl. 123-90.580.
Koga, Ituo, 4,457,272, Cl. 123-188.00M.
Teramura, Mitsuyoshi; Takimoto, Masatami; Yasuda, Takeru; and Minoura, Mikio, 4,457,279, Cl. 123-439.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Chujo, Yoshiki; Yaegashi, Takehisa; and Sugiyama, Shinichi, 4,458,319, Cl. 364-431.060.
Masaki, Masaru; Ito, Yoshinori; Inoue, Akihiko; and Toda, Munetaka, 4,457,157, Cl. 72-354.000.
Murata, Yoichi, 4,457,075, Cl. 33-203.150.
Sekiyama, Kenichi; Mishima, Yasuhiro; Hiraiwa, Hisao; and Segawa, Joichiro, 4,457,547, Cl. 293-110.000.
Tanaka, Yasushi; and Moriya, Shigeru, 4,457,525, Cl. 280-5.00A.
Watanabe, Hiroyuki; Tanaka, Yasushi; and Miura, Ken, 4,457,538, Cl. 280-801.000.
Transamerica DeLaval, Inc.: *See—*
Gebauer, Heinz, 4,457,171, Cl. 73-305.000.
Sharp, Donald L., 4,457,333, Cl. 137-454.200.
Trick, Robert E., to Medical Engineering Corporation. Penile erectile system. 4,457,335, Cl. 137-522.000.
Tridon Limited: *See—*
Kimber, Edward G.; and Norris, Peter C., 4,457,041, Cl. 15-250.420.
Trieste, Mario; and Nicholas, John D. Bridge seal for expansion grooves. 4,457,522, Cl. 277-205.000.
Trischuk, Ronald W.: *See—*
Poon, Simon; and Trischuk, Ronald W., 4,457,767, Cl. 51-298.000.
Tritec Industries, Inc.: *See—*
Durkan, Gerald, 4,457,303, Cl. 128-204.240.
Truman, Larry W. Popcorn kernal separator. 4,457,435, Cl. 209-683.000.
TRW Inc.: *See—*
Kinder, Mark R.; and Moorman, David S., 4,457,678, Cl. 418-61.00B.
Roberts, Maurice P., 4,457,132, Cl. 60-384.000.
Tsai, Shan-Chin: *See—*
Smit, Geoffrey N.; Anderson, Scott R.; and Tsai, Shan-Chin, 4,458,318, Cl. 364-424.100.
Tseng, Tsiung-Siung. Reversible watertight type container securing assembly. 4,457,650, Cl. 410-111.000.
Tsuboi, Masaharu, to Honda Giken Kogyo Kabushiki Kaisha. Burglarproof apparatus for internal combustion engine. 4,457,187, Cl. 74-411.500.
Tsuboi, Takayuki, to Canon Kabushiki Kaisha. Camera having lens protection cover. 4,457,604, Cl. 354-145.100.
Tsubouchi, Kaoru, to Aisin Seiki Kabushiki Kaisha. Reservoir with liquid level sensing device. 4,458,118, Cl. 200-84.00C.
Tsuda, Yasuo: *See—*
Ito, Kenji; Shimba, Satoru; Tsuda, Yasuo; and Sugita, Hiroshi, 4,458,012, Cl. 430-549.000.
Tsuda, Yukifumi: *See—*
Yoshida, Kunio; Kotera, Hiroaki; Tsuda, Yukifumi; Kanno, Yoshimitsu; and Naka, Motohiko, 4,458,265, Cl. 358-80.000.
Tsukada, Toshihisa: *See—*
Takasaki, Yukio; Shimomoto, Yasuharu; Tanaka, Yasuo; Sasano, Akira; and Tsukada, Toshihisa, 4,457,949, Cl. 427-39.000.
Tsuzuki, Akio, to Tomy Kogyo Co., Inc. Variable speed vehicle with satellite vehicle. 4,457,098, Cl. 446-435.000.
Tu, Ho C. Exchange transfusion machine. 4,457,747, Cl. 604-4.000.
Tuba, Istvan: *See—*
Fekete, Kalman; Karnischer, Tamas; Malovecz, Istvan; Tuba, Istvan; Lukasics, Bela; Makk nee Petranyi, Magdolna; Princz, Zoltan; and Szabo, Antal, 4,457,759, Cl. 8-94.160.
Tucholski, Gary R., to Union Carbide Corporation. Thin miniature cell construction with reshaped gasket. 4,457,990, Cl. 429-162.000.
Tuckett, Robert B.: *See—*
Kriege, Edward A.; Marshall, Paul J.; and Tuckett, Robert B., 4,457,358, Cl. 165-50.000.
Tufts, Wesley M.: *See—*
Heinze, Walter O.; and Tufts, Wesley M., 4,457,849, Cl. 210-807.000.
Tuovinen, Frans H.; Heikkila , Risto M.; Jankkila, Martti J.; Norrman, Bengt J. F.; and Honkaniemi, Matti E., to Outokumpu Oy. Method and device providing mobility to a contact shoe independent of an electrode in an electric-arc furnace. 4,458,352, Cl. 373-101.000.
Turbe, Jean-Pierre; and Meignan, Bruno, to Matix Industries, Inc. Process and apparatus for testing of rails by ultrasound. 4,457,178, Cl. 73-636.000.
Turnbull, Thomas H.: *See—*
Goyal, Ramesh C.; and Turnbull, Thomas H., 4,458,196, Cl. 324-57.00R.
Tutco, Inc.: *See—*
Howard, H. Keith; and Sherrill, Jimmy L., 4,458,141, Cl. 219-532.000.
Tutumi, Kazumichi: *See—*
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Tward, Emanuel; and Junkins, Philip D., to Tward 2001 Limited. Multiple capacitor transducer. 4,458,292, Cl. 361-283.000.
Tward 2001 Limited: *See—*
Tward, Emanuel; and Junkins, Philip D., 4,458,292, Cl. 361-283.000.
Twilley, Ian C.: *See—*
Lofquist, Robert A.; Twilley, Ian C.; and Saunders, Peter R., 4,458,053, Cl. 525-183.000.
Tyler, Derek E.: *See—*
Dantzig, Jonathan A.; and Tyler, Derek E., 4,457,354, Cl. 164-468.000.
Winter, Joseph; Dantzig, Jonathan A.; and Tyler, Derek E., 4,457,355, Cl. 164-468.000.

Tyler Refrigeration Corporation: *See*—
Bowman, Edward E., 4,457,138, Cl. 62-196.100.
Ibrahim, Fayez F., 4,457,139, Cl. 62-256.000.

Uchenick, Gordon, to Penta, Inc. Apparatus and method for preventing unauthorized use of computer programs. 4,458,315, Cl. 364-200.000.

Uchiyama, Takashi: *See*—
Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; Sakai, Shinji; Uchiyama, Takashi; and Momiyama, Kikuo, 4,457,612, Cl. 354-471.000.

Ueda, Tadakazu; and Tutumi, Kazumichi, to Toyo Kogyo Co., Ltd.; and Mitsubishi Denki Kabushiki Kaisha. Idling speed control system for internal combustion engine. 4,457,276, Cl. 123-339.000.

Ueyama, Yoshiji; and Asayama, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Fuel injection device for a multicylinder engine. 4,457,281, Cl. 123-482.000.

Uherek, Vladimir: *See*—
Hutson, Alan L.; and Uherek, Vladimir, 4,457,404, Cl. 187-29.000.

Uhlemann, Hans: *See*—
Reinehr, Ulrich; and Uhlemann, Hans, 4,457,884, Cl. 264-168.000.

Uhmann, Rainer: *See*—
Karges, Hermann E.; Heber, Helmut; Uhmann, Rainer; Teetz, Volker; and Geiger, Rolf, 4,457,866, Cl. 260-112.50R.

UI Group, Inc.: *See*—
Schmidt, Dieter; Buschor, Josef; and Spillner, Wayne K., 4,457,947, Cl. 426-438.000.

Une, Toshiaki. Reclining device for use in a vehicle. 4,457,557, Cl. 297-362.000.

Unger, Eberhart; Heitkamp, Herbert; Hessel, Heinz; Piester, Karl-Heinz; and Lagodka, Manfred, to Gewerkschaft Eisenhutte Westfalia. Hydraulic ram. 4,457,212, Cl. 92-18.000.

Union Carbide Corporation: *See*—
Garska, Daniel C.; and Ritscher, James S., 4,458,097, Cl. 585-415.000.
Lewis, Irwin C., 4,457,828, Cl. 585-11.000.
Park, Kisoon, 4,457,956, Cl. 427-203.000.
Reichle, Walter T., 4,458,026, Cl. 502-80.000.
Tucholski, Gary R., 4,457,990, Cl. 429-162.000.
Wilson, Charles A., II, 4,457,922, Cl. 424-206.000.

Union Oil Company of California: *See*—
Biale, John, 4,457,969, Cl. 428-288.000.

Union Special Corporation: *See*—
Nordstrom, Eric W., 4,457,242, Cl. 112-121.120.

Union Special GmbH: *See*—
von Hagen, Wolf-Rudiger; Jurgens, Erwin; and Bauer, Helmut, 4,457,247, Cl. 112-302.000.

United States Gypsum Company: *See*—
Palmer, Jay W.; and Gaynor, John C., 4,457,781, Cl. 106-109.000.

United States of America
Air Force: *See*—
Bar-Cohen, Yoseph; and Crane, Robert L., 4,457,174, Cl. 73-598.000.
Army: *See*—
Babbitt, Richard W.; and Stern, Richard A., 4,458,218, Cl. 333-158.000.
Holl, Herbert B.; Roberts, Thomas G.; and Barr, Thomas A., Jr., 4,458,350, Cl. 372-108.000.
Hunter, Joe S., 4,457,173, Cl. 73-510.000.
Post, Lloyd D., 4,457,232, Cl. 102-233.000.
Rittenbach, Otto E.; and Olesch, Reinhard G., 4,458,240, Cl. 340-552.000.
Energy: *See*—
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Goldberg, Marvin C.; and Cunningham, Kirk M., 4,457,624, Cl. 356-336.000.
Navy: *See*—
Becker, Henry; Hubbard, Rodney; Gibbs, Roger; and Engels, Roger, 4,457,334, Cl. 137-461.000.
Bodnar, Donald G.; and Cofer, Jams W., Jr., 4,458,250, Cl. 343-768.000.
Englar, Robert J.; and Huson, Gregory G., 4,457,480, Cl. 244-207.000.
Gill, Robert C.; and Nauflett, George W., 4,457,791, Cl. 149-19.300.
Kino, Gordon S.; Behar, David; Bowers, John E.; and Olaisen, Hermund, 4,458,328, Cl. 364-825.000.
Valentino, Pasquale A.; and Stangel, John J., 4,458,249, Cl. 343-754.000.

U.S. Philips Corporation: *See*—
Ahlstrom, Lars G. W., 4,457,475, Cl. 244-3.150.
De Keijzer, Abraham A., 4,458,174, Cl. 313-402.000.
Horl, Manfred, 4,458,210, Cl. 330-254.000.
Kraan, Arie W., 4,457,567, Cl. 308-6.00R.
Patrickson, David J.; Webster, John D.; and Schwartz, Edward, 4,457,731, Cl. 445-2.000.
Schmidt, Wolfgang, 4,458,223, Cl. 333-252.000.
Schutte, Evert H., 4,458,263, Cl. 358-30.000.
Van Heelsbergen, Teunis R., 4,457,177, Cl. 73-626.000.

U.S. Product Development Company: *See*—
Adell, Robert, 4,457,112, Cl. 49-462.000.

United Stirling AB: *See*—
Almstrom, Sten-Hakan; and Nelving, Hans G., 4,457,133, Cl. 60-524.000.

United Technologies Corporation: *See*—
Gebhart, John R.; and Ledoux, Francis X., 4,457,603, Cl. 354-80.000.
Ruckle, Duane L.; and Duvall, David S., 4,457,948, Cl. 427-34.000.
Seibert, Willard J.; and Hill, Wesley B., 4,457,667, Cl. 415-174.000.

University of California, The Regents of the: *See*—
Roose, Lars D., 4,457,360, Cl. 165-80.00B.

University of Edinburgh, The University Court of the: *See*—
Neilson, James M. M., 4,458,183, Cl. 318-139.000.

University of Nebraska, The Board of Regents of the: *See*—
Ornato, Joseph P.; Feanigkoh, Larry; and Jaeger, Colleen S., 4,457,312, Cl. 128-711.000.

University Patents, Inc.: *See*—
Caruthers, Marvin H.; and Matteucci, Mark D., 4,458,066, Cl. 536-27.000.
Hruby, Victor J.; Hadley, Mac E.; Heward, Christopher B.; and Sawyer, Tomi K., 4,457,864, Cl. 260-112.50R.

UOP Inc.: *See*—
Antos, George J., 4,458,098, Cl. 585-660.000.

Up-Right, Inc.: *See*—
Ream, Michael D., 4,457,403, Cl. 187-18.000.

Upjohn Company, The: *See*—
Kelly, Robert C., 4,458,083, Cl. 548-478.000.
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Urban Transportation Development Corporation Ltd.: *See*—
Sobolewski, George, 4,457,238, Cl. 105-168.000.

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Miller, Edward C.; Ury, John M.; and Hager, Milton S., 4,457,158, Cl. 72-354.000.

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Mohr, Dieter; Herwig, Walter; Frass, Werner; and Usbeck, Gerhard, 4,458,005, Cl. 430-271.000.

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Bates, Kenneth W.; Griffiths, William A.; and Watts, Norman H., 4,457,459, Cl. 222-599.000.

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Valbonesi, Francesco, to Isoring S.r.l. Mould for the manufacture of semi-elbows of thermally insulating material for pipes. 4,457,687, Cl. 425-394.000.

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Ashbee, William H.; Beran, Mark A.; Colglazier, Donald F.; Janssen, Donovan M.; Mantey, John P.; Martin, Ronald J.; Patch, Gerald P.; Rittenhouse, Larry E.; and Valent, James A., 4,457,506, Cl. 271-3.100.

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Van Dyk & Company Inc.: *See*—
Conner, Donald E.; and Cumpelik, Boris M., 4,457,911, Cl. 424-59.000.

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Vanderwerff, William D., to Sun Tech, Inc. Process for making naphthalene hydrodimer mixtures, product mixtures made thereby and their use as a plasticizer. 4,458,047, Cl. 524-476.000.

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Hengesh, Harold F.; Marcier, Michael J.; and Van Zeeland, Anthony J., 4,458,123, Cl. 200-159.00B.

Varian Associates, Inc.: *See*—
Holden, Scott C., 4,457,359, Cl. 165-80.00C.
Lamont, Lawrence T., Jr., 4,457,825, Cl. 204-298.000.

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Varo, Inc.: *See*—
Evans, William E.; and Gillett, Jimmie D., 4,458,199, Cl. 323-286.000.

Vassiliadis, Marc: *See*—
du Manoir de Juaye, Pierre; Guerit, Pierre; Pollet, Gilbert; and Vassiliadis, Marc, 4,457,496, Cl. 266-227.000.

Vater, Lance M. Track roller carriage assembly for supporting a sliding door, panel or the like. 4,457,046, Cl. 16-95.00R.

Vazin, Gholam R., to Chevron Research Company. Volatile hydrocarbon recovery system for tank truck unloading headers. 4,457,349, Cl. 141-86.000.

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Eichler, Volker; and Lein, Werner, deceased, 4,457,508, Cl. 271-152.000.

VEB Kombinat Textima: *See*—
Wolff, Christian; and Lippold, Gerhard, 4,457,087, Cl. 38-55.000.

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Weinzinger, Hans J.; and Pichler, Rudolf, 4,457,149, Cl. 72-10.000.

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Schmozer, Gerhard; Verdino, Heiner; and Daimer, Wolfgang, 4,458,054, Cl. 525-327.300.

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Vogg, Gunter; Engel, Hinrich; and Koch, Eckhard, 4,457,649, Cl. 410-46.000.

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Aspinwall, Ronald A., 4,457,341, Cl. 137-625.480.
Taylor, Henry D., 4,457,387, Cl. 180-6.480.

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Vienne, Alain, to Framatome. Process and device for emergency cooling of a nuclear reactor. 4,457,889, Cl. 376-282.000.

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Papalos, John G.; Villa, Jose L.; Knitter, Kathy A.; and Savoly, Arpad, 4,457,762, Cl. 44-51.000.

Villeval, Denis, to Valeo. Water box and expansion chamber structure for a heat exchanger. 4,457,363, Cl. 165-104.320.

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Bogese, Stephen B., II, 4,457,570, Cl. 339-17.00C.

Vitkovice, Unicovske strojirny koncernovy podnik: *See*—
Tolanda, Milan, 4,457,382, Cl. 173-22.000.

Vock, Manfred H.: *See*—
Hall, John B.; McGhie, Joseph A.; and Vock, Manfred H., 4,458,093, Cl. 568-378.000.

Voelz, Richard, to Renner Manufacturing Company. Steering system for gantry-type crane. 4,457,389, Cl. 180-140.000.

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Nagl, Martin, 4,457,840, Cl. 209-257.000.

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Vogt, Edward H. Duct air cover. 4,457,215, Cl. 98-103.000.

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Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., 4,457,843, Cl. 210-282.000.

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Voles, Roger, to EMI Limited. Automatically focussed optical system. 4,458,145, Cl. 250-204.000.

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Golke, Heinz; Volker, Wolfgang; and Donnerhack, Andreas, 4,457,308, Cl. 128-399.000.

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Warnecke, Rolf; and Buchholz, Peter, 4,457,679, Cl. 418-91.000.

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von Blucher, Hubert; von Blucher, Hasso; and de Ruiter, Ernest, 4,457,345, Cl. 139-420.00R.

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von der Ohe, Manfred; and Flemming, Helmut, to Daimler-Benz Aktiengesellschaft. Independent wheel suspension. 4,457,537, Cl. 280-675.000.

von Hagen, Wolf-Rudiger; Jurgens, Erwin; and Bauer, Helmut, to Union Special GmbH. Thread control mechanism for sewing machines. 4,457,247, Cl. 112-302.000.

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von Wedel, Karl. Cooling process for material beds of bulk materials. 4,457,081, Cl. 34-20.000.

Vorhaus, James L., to Raytheon Company. Variable phase shifter. 4,458,219, Cl. 333-164.000.

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Vulcan Industrial Packaging Limited: *See*—
Kirkis, Peter G., 4,457,447, Cl. 220-306.000.

W. R. Grace & Co.: *See*—
Sherwin, Martin B., 4,458,094, Cl. 568-947.000.
Welsh, William A.; Seese, Mark A.; and Peters, Alan W., 4,458,023, Cl. 502-65.000.

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Atkins, J. Harell; and Owensby, Joseph E., 4,457,122, Cl. 53-434.000.

Wada, Hiroto; and Fujiwara, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. Electret device. 4,458,161, Cl. 307-400.000.

Wagatsuma, Yuji, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for manufacturing a lamp. 4,458,136, Cl. 219-137.00R.

Wagener, Hans, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Holder for light tracks. 4,457,481, Cl. 248-68.100.

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Shepard, John K.; and Wagonseller, Walter R., 4,457,465, Cl. 229-5.600.

Wain-Roy, Inc.: *See*—
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Wakai & Co., Ltd.: *See*—
Hasegawa, Takeo, 4,457,651, Cl. 411-29.000.

Wakamiya, Koichi, to Nippon Kogaku K.K. Behind diaphragm lens. 4,457,596, Cl. 350-472.000.

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Walker, Peter S., to Howmedica Inc. Intramedullary fixation device. 4,457,301, Cl. 128-92.0BC.

Wallentowitz, Henning: *See*—
Papenhagen, Dieter; Wallentowitz, Henning; Lepler, Gerhard; and Hampp, Martin, 4,457,189, Cl. 74-513.000.

Wallerstein, Robert S. Firearm safety lock. 4,457,091, Cl. 42-1.0LP.

Walles, Wilhelm E., to Dow Chemical Company, The. Metallized plastic articles. 4,457,977, Cl. 428-463.000.

Walsh, Cyral M.: *See*—
Fay, John A.; Walsh, Cyral M.; and Ko, Venancio, 4,457,323, Cl. 134-18.000.

Walsh, David J. Disposable flashlight. 4,458,300, Cl. 362-206.000.

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Ernst, Horst M.; Brandenstein, Manfred; and Walter, Lothar, 4,457,395, Cl. 180-254.000.
Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, 4,457,740, Cl. 474-112.000.

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Chenot, Charles F.; and Walter, Wolfgang, 4,458,176, Cl. 313-487.000.

Walters, Gerald E., to Automation Industries, Inc. Electromagnetically shielded connector. 4,457,574, Cl. 339-143.00R.

Wang, Tsing-Chow: *See*—
Josephs, Richard M.; and Wang, Tsing-Chow, 4,458,160, Cl. 307-306.000.

Warnecke, Rolf; and Buchholz, Peter, to Volkswagenwerk Aktiengesellschaft. Vane pump with unilateral bearing. 4,457,679, Cl. 418-91.000.

Warner, Patricia A.; Greminger, George K.; and Gibson, Clark W., to Dow Chemical Company, The. Water-soluble, ternary cellulose ethers. 4,458,068, Cl. 536-91.000.

Wasa, Kiyotaka: *See*—
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Wason, Cameron B., to Texas Instruments Incorporated. Seismic prospecting using a continuous shooting and continuous recording system. 4,458,339, Cl. 367-14.000.

Wasson, John J., to Smithwick Lures, Inc. Fishing lure. 4,457,096, Cl. 43-42.420.

Watanabe, Akira, to Mitsubishi Jukogyo Kabushiki Kaisha. Article exchange apparatus. 4,457,659, Cl. 414-223.000.

Watanabe, Hiroyuki; Tanaka, Yasushi; and Miura, Ken, to Toyota Jidosha Kogyo Kabushiki Kaisha. Front seat belt retractor disposing structure. 4,457,538, Cl. 280-801.000.

Watanabe, Kenkichi; Furuya, Katsuke; and Kimoto, Toyoki, to Laurel Bank Machine Co., Ltd. Coin handling apparatus. 4,457,321, Cl. 133-8.00A.

Watanabe, Masaru: *See*—
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Shimabukuro, Hajime; Watanabe, Shuichi; Katayama, Shitomi; and Ohno, Akira, 4,457,598, Cl. 350-288.000.

Watanabe, Yoshikuni, to Tokyo Shibaura Denki Kabushiki Kaisha. Hermetic type rotary compressor with silencer means. 4,457,671, Cl. 417-312.000.

Waterbury, L. David: *See*—
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Watkins, Bruce J., to Hughes Tool Company. Flowline pull-in apparatus and method. 4,457,378, Cl. 166-347.000.

Watson, John T.: *See*—
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Watson, Keith R. High efficiency hydrocarbon reduction of silica. 4,457,902, Cl. 423-350.000.

Watson, Robert, Jr.: *See*—
Grearson, Kenneth R.; and Watson, Robert, Jr., 4,457,115, Cl. 52-73.000.

Watts, Norman H.: *See*—
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Wawzonek, Stanley. Formaldehyde depressed particle board. 4,457,978, Cl. 524-14.000.

Weaver, William H.: *See*—
Bryant, Richard M.; Clemen, Henry P., Jr.; and Weaver, William H., 4,458,296, Cl. 361-383.000.

Webb, Paul P.: *See*—
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Webb, Stanley G.: *See*—
Carman, Kenneth K.; and Webb, Stanley G., 4,457,735, Cl. 464-32.000.

Weber, Harold J. Frequency dependent pulsed gain modulated concealed structure locator. 4,458,204, Cl. 324-326.000.

Weber, Heinrich: *See*—
Kreft, Wilfried; Rother, Wolfgang; Tiggesbaumker, Peter; Menzel, Karl; Schmelter, Herbert W.; and Weber, Heinrich, 4,457,082, Cl. 34-57.00E.

Weber, William R. Lever tumbler lock pick set. 4,457,191, Cl. 81-3.00R.

Webster, John D.: *See*—
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Weekley, Robert R. Mosaic additive reflectance color display screen. 4,458,175, Cl. 313-472.000.

Weiler Brush Company: *See*—
Hettes, Frank J., 4,457,040, Cl. 15-180.000.

Weinerman, Lee S., to Eastern Company, The. Sliding door lock. 4,457,146, Cl. 70-100.000.

Weinzinger, Hans J.; and Pichler, Rudolf, to Veest-Alpine Aktiengesellschaft. Apparatus for producing coils of metal strip. 4,457,149, Cl. 72-10.000.

Weiss, Eberhard: *See*—
Koehler, Wolfgang; Blocher, Hans-Joachim; and Weiss, Eberhard, 4,457,388, Cl. 180-9.480.

Weiss, Urs: *See*—
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Welburn, Ross D., to Motornetics Corporation. Toothed reluctance synchro/resolver. 4,458,168, Cl. 310-185.000.

Weldex, Inc.: *See*—
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Welk, John R.: *See*—
Tenney, David L.; Krause, James; and Welk, John R., 4,458,178, Cl. 315-8.000.

Welsh, William A.; Seese, Mark A.; and Peters, Alan W., to W. R. Grace & Co. Catalyst manufacture. 4,458,023, Cl. 502-65.000.

Weman, Per O.; and Neumann, Fred F., to N. V. Klippan S.A. Belt load indicator. 4,457,251, Cl. 116-212.000.

Wenzel, Eberhard: *See*—
Broker, Klaus D.; Bruning, Paul; and Wenzel, Eberhard, 4,457,745, Cl. 494-15.000.

Wepner, Joachim; Barysch, Hubert; and Kruse, Erwin, to Peddinghaus, Rolf. Device for cutting and/or stamping metal bars and sections. 4,457,197, Cl. 83-197.000.

Werley, Barry L.; Snyder, Richard H.; McQuillen, Joseph E.; and Miller, Keith A., to Air Products and Chemicals, Inc. Safety pressure regulator. 4,457,329, Cl. 137-73.000.

Wesendunk, Richard J.: *See*—
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Wesley, Richard H. Organism destruction by electrohydraulic discharge within a pulsed magnetic field envelope. 4,458,153, Cl. 250-435.000.

Westbrook, Carl M. Torque measuring device. 4,457,183, Cl. 73-862.320.

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Western Design Corporation: *See*—
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Westinghouse Electric Corp.: *See*—
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Endo, Jerry K.; and Connell, Jeffrey P., 4,457,518, Cl. 277-34.300.
Husson, Alan L.; and Uherek, Vladimir, 4,457,404, Cl. 187-29.000.
Matty, Thomas C.; Whalen, Dennis E.; Schmitz, William E.; and DeTine, Pamela E., 4,458,185, Cl. 318-270.000.
Nathenson, Richard D.; Pipich, Charles W.; and Kopnitsky, Joseph R., deceased, 4,458,166, Cl. 310-71.000.
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Westwood, William B.: *See*—
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Wetmore, Halsey J., to Adams Hard-Facing Company, Inc. Stubble mulch sweep. 4,457,381, Cl. 172-722.000.

Weyde, Edith; Saleck, Wilhelm; Psaar, Hubertus; von Konig, Anita; and Ohlschlager, Hans, to Agfa-Gevaert Aktiengesellschaft. Process for the production of color photographic images and photographic recording materials. 4,458,009, Cl. 430-350.000.

Weymouth, William M.; and Shah, Dilip C., to Basic Four Corporation. Circuit board identity generator. 4,458,357, Cl. 377-2.000.

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Wheeler, Glenn; and Ptasinski, James F., to Texas Instruments Incorporated. Programmable architecture logic. 4,458,163, Cl. 307-466.000.

Whipple, Terry L.: *See*—
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White Consolidated Industries, Inc.: *See*—
Eibe, Werner W., 4,457,155, Cl. 72-241.000.

White, Herbert B. Transmission line composite beam suspension assembly. 4,458,102, Cl. 174-43.000.

Whitmarsh, Herbert F., to Initial Plastics Ltd. Covers for the wheels of motor cars. 4,457,561, Cl. 301-37.0SS.

Whitney, Daniel E.; and Seltzer, Donald S., to Charles Stark Draper Laboratory, Inc., The. Self-teaching robot feedback system. 4,458,321, Cl. 364-513.000.

Wiant, Morris N.; and Schmidt, Frank T., to Coleman Company, Inc., The. Bumper assembly for trailer. 4,457,546, Cl. 293-102.000.

Wichman, Cynthia A., to Kendall Company, The. Disposable garment with card tunnel. 4,457,024, Cl. 2-51.000.

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Wiechert, Rudolf: *See*—
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Wiederrich, James L., to FMC Corporation. Apparatus and method for drive shaft signature analysis. 4,457,165, Cl. 73-116.000.

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Wiehl, Alfred: *See*—
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Wild, Jurg: *See*—
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Wilder, Richard P., Jr., to Honeywell Information Systems Inc. Apparatus for loading programmable bit matrices used in a hardware monitoring interface unit. 4,458,309, Cl. 364-200.000.

Wiley, William C.: *See*—
Taylor, Robert M.; and Wiley, William C., 4,457,808, Cl. 204-1.00T.

Wilhelm Frank GmbH: *See*—
Frank, Wilhelm, 4,457,107, Cl. 49-192.000.

Wilks, Gerald W., to LaSalle Steel Company. Process for annealing steels. 4,457,789, Cl. 148-134.000.

Willcox, Frederick P. Squeeze printing mechanism. 4,457,637, Cl. 400-172.000.

Willey, Michael R.; and Jolliffe, Raymond. Fire extinguishing apparatus. 4,458,239, Cl. 340-540.000.

Wm. T. Burnett & Co., Inc.: *See*—
Fracalossi, Roland N.; and Wajer, Mark T., 4,458,034, Cl. 521-107.000.

Williams, Sidney J.: *See*—
Braithwaite, John D.; King, Derrick O.; Williams, Sidney J.; and Prior, James, 4,457,642, Cl. 401-188.00R.

Williamson, Robert R.: *See*—
Derby, Norwin C.; and Williamson, Robert R., 4,457,456, Cl. 222-105.000.

Willis, Barry G.; Schleifer, Arthur; Bell, Norton W.; Dryden, Paul C.; Stefanski, Andrew; and Dorny, C. Nelson, to Hewlett-Packard Company. Method of performing measurements and error analysis of the measurements. 4,458,323, Cl. 364-582.000.

Willy Habegger AG: *See*—
Habegger, Willy; and Lauber, Ernst, 4,457,035, Cl. 14-18.000.

Wilson, Arthur C.; and Eigelbach, Ray C., to General Electric Company. Door latch assembly. 4,457,545, Cl. 292-29.000.

Wilson, Charles A., II, to Union Carbide Corporation. Pesticidal bisphenol phosphates. 4,457,922, Cl. 424-206.000.

Wilson, James D. Key lock for plastic receptacles. 4,457,433, Cl. 206-505.000.

Wilson, John D. Surgical 'in-line' evacuator. 4,457,755, Cl. 604-184.000.

Wilson, Larry R.: *See*—
Conklin, Jerry R.; and Wilson, Larry R., 4,457,860, Cl. 252-344.000.

Wilson, Norman H.: *See*—
Jones, Robert L.; and Wilson, Norman H., 4,458,091, Cl. 562-502.000.

Wilson, Patricia A.: *See*—
Cox, Ronald I.; Hoskinson, Ronald M.; Scaramuzzi, Rex J.; Wilson, Patricia A.; and George, John M., 4,457,914, Cl. 424-88.000.

Wilson, Robert C., Jr.: *See*—
Oleck, Stephen M.; and Wilson, Robert C., Jr., 4,458,024, Cl. 502-66.000.

Wilson, William I. Abrasive bodies. 4,457,765, Cl. 51-293.000.

Windgrabber Corporation, The: *See*—
Selman, W. Robertson, Jr., 4,457,666, Cl. 415-2.00R.

Windsor, Harry M., to Automotive Products Limited. Clutch control means. 4,457,414, Cl. 192-3.580.

Wingfield, Robert C., Jr.; Braslaw, Jacob; and Gealer, Roy L., to Ford Motor Company. Use of zinc and copper (I) salts to reduce sulfur and nitrogen impurities during the pyrolysis of plastic and rubber waste to hydrocarbons. 4,458,095, Cl. 585-241.000.

Winter, Joseph; Dantzig, Jonathan A.; and Tyler, Derek E., to International Telephone and Telegraph Corporation. Apparatus and a method for making thixotropic metal slurries. 4,457,355, Cl. 164-468.000.

Wirtz, Jimmy D.: *See*—
Lautzenhiser, Theodore V.; and Wirtz, Jimmy D., 4,457,168, Cl. 73-151.000.

Wirtz, Walter: *See*—
Becher, Heinz-Manfred; Prokic-Immel, Ricarda; and Wirtz, Walter, 4,457,943, Cl. 424-322.000.

Witkowski, William. Plastic bowling pin and method of making the same. 4,457,511, Cl. 273-82.00R.

Wittek, Harry, to Bartizan Corporation. Rolling platen imprinter. 4,457,228, Cl. 101-45.000.

Witthaus, Martin: *See*—
Saran, Herbert, deceased; and Witthaus, Martin, 4,457,858, Cl. 252-182.000.

Wittmann, Julius: *See*—
Klement, Ekkehard; and Wittmann, Julius, 4,457,467, Cl. 228-103.000.

Wittmann, Otto: *See*—
Diem, Hans; Fritsch, Robert; Lehnert, Heinz; Matthias, Guenther; Schatz, Hermann; and Wittmann, Otto, 4,458,049, Cl. 524-595.000.

Wittrisch, Christian, to Institut Francais du Petrole. Method and device for effecting, by means of specialized tools, such operations as measurements in highly inclined to the vertical or horizontal well portions. 4,457,370, Cl. 166-250.000.

Wixon, Harold E.: *See*—
Gangwisch, William J.; Richter, Virgil J.; Wixon, Harold E.; and Wraga, Joseph B., 4,457,854, Cl. 252-91.000.

Wobken, Gerold: *See*—
Ruge, Hans; and Wobken, Gerold, 4,457,564, Cl. 305-10.000.

Wohlschlager, Michael: *See*—
Dietl, Josef; Holm, Claus; Kotilge, Jorg; and Wohlschlager, Michael, 4,457,903, Cl. 423-350.000.

Wold, Allan N., to DAT Agri-Products, Inc. Combine hopper cover. 4,457,444, Cl. 220-213.000.

Wolf, Johann, to Siemens Aktiengesellschaft. Quenching baffles for an electrical overload fuse. 4,458,232, Cl. 337-273.000.

Wolf, Rainer: *See*—
Mauric, Claudine; and Wolf, Rainer, 4,458,045, Cl. 524-119.000.

Wolff, Christian; and Lippold, Gerhard, to VEB Kombinat Textima. Steam trough mangle with heat recycling apparatus. 4,457,087, Cl. 38-55.000.

Wolverine Technology, Inc.: *See*—
Klochko, Stephen, 4,457,645, Cl. 404-90.000.

Womack, Billy B., to Corning Glass Works. Compliant termination for ceramic chip capacitors. 4,458,294, Cl. 361-321.000.

Womako Maschinenkonstruktionen: *See*—
Fabrig, Paul, 4,457,655, Cl. 412-7.000.

Wong, Mon N.; and Taormina, Frank A., to Hughes Aircraft Company. Slot-coupled microwave diplexer and coupler therefor. 4,458,217, Cl. 333-135.000.

Wong, Rayman Y., to Stauffer Chemical Company. Insect repellent compounds. 4,457,934, Cl. 424-263.000.

Wood, Joseph A.: *See*—
Allan, Thomas T.; Bowers, Cecil W.; and Wood, Joseph A., 4,457,336, Cl. 137-601.000.

Woodard, Charles C.: *See*—
Mui, Paul K.; Smith, James H.; Woodard, Charles C.; and Albrecht, Laurence J., 4,458,282, Cl. 360-133.000.

Wraga, Joseph B.: *See*—
Gangwisch, William J.; Richter, Virgil J.; Wixon, Harold E.; and Wraga, Joseph B., 4,457,854, Cl. 252-91.000.

Wright, Ian G.: *See*—
Goodger, Brian V.; Mahoney, David F.; and Wright, Ian G., 4,457,915, Cl. 424-88.000.

Wright-Malta Corporation: *See*—
Schoenberg, Steve A.; Ellis, David G.; and Aronstein, Jesse, 4,457,203, Cl. 84-454.000.

Wuensch, Charles L. Apparatus for loading and unloading vehicles. 4,457,424, Cl. 198-747.000.

Wunsch, Adolf. Automatic punching and bending machine. 4,457,160, Cl. 72-446.000.

Wurzburg, Henry: *See*—
Dellande, Brian W.; and Wurzburg, Henry, 4,458,206, Cl. 329-50.000.

Xerox Corporation: *See*—
Bean, Lloyd F.; and Miller, Roger L., 4,457,996, Cl. 430-122.000.
Gross, Thomas D.; and Jagger, Brian E., 4,457,738, Cl. 464-115.000.
Gruber, Robert J.; Bolte, Steven B.; Grushkin, Bernard; and Koch, Ronald J., 4,457,998, Cl. 430-98.000.
Pai, Damodar M.; and Yanus, John F., 4,457,994, Cl. 430-59.000.
Seanor, Donald A., 4,457,615, Cl. 355-3.0CH.

Yabumoto, Yukinobu: *See*—
Kirino, Hisao; Yabumoto, Yukinobu; Iritani, Takashi; Suga, Masao; Nakanishi, Yukinaga; and Itoh, Masaru, 4,457,819, Cl. 204-181.00R.

Yaegashi, Takehisa: *See*—
Chujo, Yoshiki; Yaegashi, Takehisa; and Sugiyama, Shinichi, 4,458,319, Cl. 364-431.060.

Yakovlev, Mikhail N.: *See*—
Chernikhov, Alexei Y.; Yakovlev, Mikhail N.; Rogov, Nikolai S.; Petrova, Aleftina P.; Martirosov, Eduard B.; and Gul, Valentin E., 4,458,041, Cl. 523-435.000.

Yamada, Kazuharu: *See*—
Kodama, Hisashi; Sato, Katsujiro; Tamura, Tetsuomi; Hamamoto, Tooru; and Yamada, Kazuharu, 4,457,270, Cl. 123-90.580.

Yamada, Shigeo: *See*—
Takawashi, Tamio; Sakakibara, Toshimitsu; and Yamada, Shigeo, 4,458,190, Cl. 318-603.000.

Yamaguchi, Hisashi; Yoshikawa, Kazuo; and Kurahashi, Keizo, to Fujitsu Limited. Self shift type gas discharge panel driving system. 4,458,244, Cl. 340-768.000.

Yamaguchi, Katsumi: *See*—
Okada, Hitoshi; Takai, Kazuki; and Yamaguchi, Katsumi, 4,458,276, Cl. 360-96.500.

Yamaha Hatausoki Kabushiki Kaisha: *See*—
Katsuoka, Tatsuzo, 4,457,552, Cl. 296-78.100.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Yoshiwara, Tomomasa, 4,457,524, Cl. 280-5.00A.

Yamaji, Kathuhiko: *See*—
Nishizaki, Tomoyoshi; Miyamoto, Minoru; Miyamoto, Kazuaki; Yoshida, Ken; Yamaji, Kathuhiko; and Nakata, Yasushi, 4,457,136, Cl. 62-48.000.

Yamaji, Nobuyuki; Tahara, Kyoko; and Kato, Motohiko, to Kikkoman Corporation. Process for producing $N^6,O^{2'}$-diacyladenosine-3',5'-cyclic phosphoric ester alkali metal salts. 4,458,067, Cl. 536-27.000.

Yamamoto, Etsuji: *See*—
Takeuchi, Hiroshi; Ito, Yukio; Yamamoto, Etsuji; Jyomura, Shigeru; and Ashida, Sakichi, 4,458,172, Cl. 310-334.000.

Yamamoto, Hachizou: *See*—
Horigome, Koichi; Okada, Seizo; Nishimura, Katsuji; and Yamamoto, Hachizou, 4,458,317, Cl. 364-406.000.

Yamamoto, Koji; and Yoshida, Fumio, to Minolta Camera Kabushiki Kaisha. Camera with a motor driven film transport device. 4,457,605, Cl. 354-173.110.

Yamamoto, Shigemitu: *See*—
Kashimoto, Hiroo; Kosa, Tadatoshi; Inoue, Akihiko; Yamamoto, Shigemitu; and Kuroishi, Katuhiko, 4,458,108, Cl. 174-152.00R.

Yamamoto, Yoshiaki: *See*—
Takeshita, Isao; Yamamoto, Yoshiaki; and Tanaka, Hiroyoshi, 4,457,143, Cl. 62-476.000.

Yamamura, Takashige; and Matsumoto, Satosi, to Kabushiki Kaisha Kobe Seiko Sho. Horizontal tube upsetter. 4,457,156, Cl. 72-316.000.

Yamamuro, Kiyohiko; Hirano, Shigeo; and Iwasa, Yasuo, to Fuji Photo Film Co., Ltd. Process for bleaching color photographic sensitive materials. 4,458,010, Cl. 430-393.000.

Yamanaka, Shigeru; Utagawa, Takashi; and Kobayashi, Tadao, to Ajinomoto Co., Inc. Production of 1-β-D-ribofuranosyl-1,2,4-triazole. 4,458,016, Cl. 435-85.000.

Yamane, Kazumasa; and Kobayashi, Masahiro, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Cross-linked vinyl chloride polymer. 4,458,060, Cl. 526-292.300.

Yamanouchi Pharmaceutical Co.: *See*—
Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; Tomioka, Kenichi; and Numasaki, Yoso, 4,457,872, Cl. 260-465.00D.

Yamashita, Yasuhiro: *See*—
Irie, Shin-ichi; Yamashita, Yasuhiro; Nakano, Takao; and Tanabe, Teruyoshi, 4,458,103, Cl. 174-73.00R.

Yamatani, Shigeru: *See*—
Fukuda, Minoru; Yamatani, Shigeru; Nishimura, Kotaro; and Endo, Akira, 4,458,348, Cl. 365-185.000.

Yan, Tsoung-Yuan; and Shu, Paul, to Mobil Oil Corporation. Regeneration of cationic resin in nonaqueous media. 4,458,033, Cl. 521-26.000.

Yanabu, Satoru; Tamagawa, Tohoru; Kaneko, Eiji; and Funahashi, Takumi, to Tokyo Shibaura Denki Kabushiki Kaisha. DC Circuit breaker. 4,458,121, Cl. 200-148.00R.

Yanagihara, Toshio; and Tominaga, Tsunekichi, to Kabushiki Kaisha Kobe Seiko Sho. Apparatus for conveying and shaping rubber sheet materials. 4,457,802, Cl. 156-405.100.

Yanagisawa, Mamoru; Akasaki, Hidehiko; and Aoki, Hideji, to Fujitsu Limited. Package for enclosing semiconductor elements. 4,458,291, Cl. 361-212.000.

Yanagisawa, Sadakatsu: *See*—
Otani, Sugio; Yanagisawa, Sadakatsu; and Niijima, Kunio, 4,457,984, Cl. 428-220.000.

Yanaka, Takashi: *See*—
Koike, Hirotami; Yanaka, Takashi; and Watanabe, Masaru, 4,458,151, Cl. 250-310.000.

Yanus, John F.: *See*—
Pai, Damodar M.; and Yanus, John F., 4,457,994, Cl. 430-59.000.

Yardney Corporation: *See*—
Fields, Larry D., 4,457,330, Cl. 137-102.000.
Fields, Larry D., 4,458,059, Cl. 210-266.000.

Yastrebov, Petr I.: *See*—
Akhmadiev, Galimzyan M.; Buvailo, Ilya A.; Morgun, Vasily M.; Mutin, Felix I.; and Yastrebov, Petr I., 4,457,236, Cl. 104-138.00G.

Yasuda, Takeru: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Yasuda, Takeru; and Minoura, Mikio, 4,457,279, Cl. 123-439.000.

Yasukawa, Yozo, to Sharp Kabushiki Kaisha. Removal of static electricity on a liquid crystal display during rubbing process. 4,457,588, Cl. 350-336.000.

Yatagai, Toyohiko: *See*—
Idesawa, Masanori; and Yatagai, Toyohiko, 4,457,626, Cl. 356-376.000.

Yatsko, Michael S.: *See*—
Cookson, Alan H.; and Yatsko, Michael S., 4,458,101, Cl. 174-31.00R.

Yayama, Kazuo: *See*—
Takahashi, Toshikatsu; and Yayama, Kazuo, 4,457,619, Cl. 355-60.000.

Yokoi, Nobufumi: *See*—
Kataishi, Takao; and Yokoi, Nobufumi, 4,457,628, Cl. 366-67.000.

Yokosuka, Takehiko, to Pilot Ink Co., Ltd. Ball-point pen tip. 4,457,644, Cl. 401-216.000.

Yokota, Hideo, to Canon Kabushiki Kaisha. Photographic lens system. 4,457,593, Cl. 350-448.000.

Yorinks, Leonard H.: *See*—
Landry, Norman R.; and Yorinks, Leonard H., 4,458,229, Cl. 333-248.000.

York-Shipley, Inc.: *See*—
Korenberg, Jakob, 4,457,289, Cl. 122-4.00D.

Yoshiaki, Omura: *See*—
Fumio, Mori; Yoshiaki, Omura; Takashi, Nishida; and Kazuo, Itoi, 4,458,090, Cl. 560-124.000.

Yoshida, Fumio: *See*—
Yamamoto, Koji; and Yoshida, Fumio, 4,457,605, Cl. 354-173.110.

Yoshida, Hitoshi; and Suzuki, Seiichi, to Suzuki Motor Company Limited. Rotational speed controlling device for automatic transmissions using sliding engagement piece. 4,457,185, Cl. 74-336.00R.

Yoshida Industry Co., Ltd.: *See*—
Nakazawa, Hideri; and Hatakeyama, Yoshiharu, 4,457,961, Cl. 428-35.000.

Yoshida, Ken: *See*—
Nishizaki, Tomoyoshi; Miyamoto, Minoru; Miyamoto, Kazuaki; Yoshida, Ken; Yamaji, Kathuhiko; and Nakata, Yasushi, 4,457,136, Cl. 62-48.000.

Yoshida Kogyo K. K.: *See*—
Osaki, Tatsuo, 4,457,062, Cl. 29-408.000.

Yoshida Kogyo K.K.: *See*—
Kamzaka, Yoshihiro, 4,457,050, Cl. 24-108.000.

Yoshida, Kunio; Kotera, Hiroaki; Tsuda, Yukifumi; Kanno, Yoshimitsu; and Naka, Motohiko, to Matsushita Research Institute Tokyo, Inc. Color image duplicating system. 4,458,265, Cl. 358-80.000.

Yoshikawa, Kazuo: *See*—
Yamaguchi, Hisashi; Yoshikawa, Kazuo; and Kurahashi, Keizo, 4,458,244, Cl. 340-768.000.

Yoshimura, Toyofusa: *See*—
Kawamoto, Mineo; Murakami, Kanji; Itoh, Yutaka; Matsuda, Youichi; Wajima, Motoyo; Morishita, Hirosada; Kawakubo, Shoji; and Yoshimura, Toyofusa, 4,457,952, Cl. 427-98.000.

Yoshimura, Yasuo: *See*—
Suzuki, Hiroo; Kuno, Tadashi; Yoshimura, Yasuo; Okugami, Kiyoshi; Hotta, Hisashi; and Otsuka, Shinya, 4,458,040, Cl. 523-412.000.

Yoshioka, Hachiro, to Nissan Motor Company, Limited. Catalytic converter for treating exhaust gases. 4,457,141, Cl. 60-299.000.

Yoshiwara, Tomomasa, to Yamaha Hatsudoki Kabushiki Kaisha. Motorcycle seat. 4,457,524, Cl. 280-5.00A.

Yoshiyama, Toshio: *See*—
Nakajima, Tadanobu; Iseki, Masahide; and Yoshiyama, Toshio, 4,457,614, Cl. 355-3.00R.

Young, Harlan S.: *See*—
Hatchadoorian, Edward; Ostapchenko, George J.; Patton, James L.; and Young, Harlan S., 4,457,797, Cl. 156-242.000.

Young, Ian R., to Picker International Limited. Nuclear magnetic resonance imaging. 4,458,203, Cl. 324-309.000.

Young, Jack H., to American Sterilizer Company. Biocidal gas sterilization and gas leakage determination. 4,457,892, Cl. 422-2.000.

Yugenkaisha Nakaya Nokogirikikai Seisakusho: *See*—
Nanba, Taro, 4,457,190, Cl. 76-43.000.

Zandona, Oliver J.; Hettinger, William P., Jr.; Kovach, Stephen M.; and Beck, Hubert W., to Ashland Oil, Inc. Process and catalyst for the conversion of carbo-metallic containing oils. 4,457,833, Cl. 208-120.000.

Zarley, McKee, Thomte, Voorhees & Sease: *See*—
Van Cleave, Jon S., 4,457,910, Cl. 424-59.000.

Zasio, John J.; and Samuels, Michael W., to Fujitsu, Limited. Discharge device and method for use in processing semiconductor devices. 4,458,129, Cl. 219-68.000.

Zeidler, Ulrich: *See*—
Conrad, Jens; Schaper, Ulf-Armin; and Zeidler, Ulrich, 4,457,944, Cl. 424-358.000.

Zeiringer, Rudolf: *See*—
List, Helmut; Claassen, Peter; and Zeiringer, Rudolf, 4,457,180, Cl. 73-756.000.

Zengel, Hans; and Bergfeld, Manfred, to Akzona Incorporated. Preparation of trans cyclohexane,1,4-diisocyanate and related compounds. 4,457,871, Cl. 260-453.00P.

Zenith Radio Corporation: *See*—
Ciciora, Walter, 4,458,268, Cl. 358-120.000.
Gioia, Norman F.; and Seher, Fred H., 4,457,733, Cl. 445-36.000.

Zepp, Lawrence P.: *See*—
Kern, Calvin V.; and Zepp, Lawrence P., 4,457,725, Cl. 440-61.000.

Zerpa Industries, Inc.: *See*—
Pastor, Manuel G., 4,457,805, Cl. 202-83.000.

Ziegler, Klaus: *See*—
Bernauer, Otto; and Ziegler, Klaus, 4,457,891, Cl. 420-434.000.

Zielske, Alfred G.: *See*—
Sudbury, Barry A.; and Zielske, Alfred G., 4,457,855, Cl. 252-98.000.

Zima, Petr F.: *See*—
Timoshenko, Grigory M.; Kravets, Vladimir G.; Timoshenko, Vladimir G.; Zima, Petr F.; Astrakhan, Alexandr Z.; Overko, Valentin M.; Isadchenko, Vasily S.; Lenenko, Stanislav A.; Goldynsky, Gennady G.; Osmanian, Karo A.; Aralov, Evgeny G.; Maleev, Georgy V.; Kuzmich, Igor A.; Ekber, Boris Y.; and Kreschenko, Nikolai A., 4,457,331, Cl. 137-119.000.

Zlatop pri Ban: *See*—
Konstantinov, Ivan T.; Mednikarov, Borislav D.; Sahatchieva, Maria A.; and Burov, Atanas T., 4,458,008, Cl. 430-302.000.

Zodrow, Rudolf, to Jagenberg Aktiengesellschaft. Labeling station for articles like bottles. 4,457,801, Cl. 156-364.000.

Zukausky, Keith E., to Eaton Corporation. Flow washer. 4,457,343, Cl. 138-45.000.

Zuraw, Bruce L.: *See*—
Bohn, Joseph W.; Cohen, Peter A.; and Zuraw, Bruce L., 4,458,020, Cl. 435-296.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF JULY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Badmin, John S.; and Jones, Richard F., to Shell Oil Company. Pesticidal cinnolines. Re. 31,623, Cl. 424-250.000.

Bayer Aktiengesellschaft: *See*—
Kaspers, Helmut; and Brandes, Wilhelm, Re. 31,625, Cl. 424-272.000.

Brandes, Wilhelm: *See*—
Kaspers, Helmut; and Brandes, Wilhelm, Re. 31,625, Cl. 424-272.000.

Dewhirst, Floyd E., to Forsyth Dental Infirmary for Children. Method of treating inflammation. Re. 31,624, Cl. 424-258.000.

Forsyth Dental Infirmary for Children: *See*—
Dewhirst, Floyd E., Re. 31,624, Cl. 424-258.000.

Holley Engineering Company, Inc.: *See*—
Holley, John D., Re. 31,619, Cl. 15-179.000.

Holley, John D., to Holley Engineering Company, Inc. Sweeper bristle and method of making. Re. 31,619, Cl. 15-179.000.

Jones, Richard F.: *See*—
Badmin, John S.; and Jones, Richard F., Re. 31,623, Cl. 424-250.000.

Kaspers, Helmut; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Fungicidal agents processes for their preparation and their use for combating fungi. Re. 31,625, Cl. 424-272.000.

Kobayashi, Kouji: *See*—
Moroto, Shuzo; and Kobayashi, Kouji, Re. 31,621, Cl. 192-3.280.

Leahy, Sidney M., to Minnesota Mining and Manufacturing Co. Coated abrasive product containing fused zirconia grains and method for abrading iron. Re. 31,620, Cl. 51-328.000.

Mano, Hiroshi; and Oga, Toshisaburo, to Sumitomo Electric Industries, Ltd. Tubular organic prosthesis. Re. 31,618, Cl. 3-1.400.

Minnesota Mining and Manufacturing Co.: *See*—
Leahy, Sidney M., Re. 31,620, Cl. 51-328.000.

Moroto, Shuzo; and Kobayashi, Kouji. Lock-up clutch for a hydraulic unit. Re. 31,621, Cl. 192-3.280.

Oga, Toshisaburo: *See*—
Mano, Hiroshi; and Oga, Toshisaburo, Re. 31,618, Cl. 3-1.400.

Rijn-Schelde-Verolme Machinefabrieken en Scheepsswerven N.V.: *See*—
Todd, Robert E., Re. 31,622, Cl. 299-1.000.

Shell Oil Company: *See*—
Badmin, John S.; and Jones, Richard F., Re. 31,623, Cl. 424-250.000.

Sumitomo Electric Industries, Ltd.: *See*—
Mano, Hiroshi; and Oga, Toshisaburo, Re. 31,618, Cl. 3-1.400.

Todd, Robert E., to Rijn-Schelde-Verolme Machinefabrieken en Scheepswerven N.V. Mining machine having rectangular thrust transmitting conveyor column. Re. 31,622, Cl. 299-1.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Carmichael, Duncan G., to Martin Marietta Corporation. Water-insoluble benzothiazole monoazo dyes. B1 3,502,645, 7-3-84, Cl. 260-158.000.

Hickman, John B., to W. P. Hickman Company, Inc. Gravel stop. B1 4,071,987, 7-3-84, Cl. 52-94.000.

Martin Marietta Corporation: *See*—
Carmichael, Duncan G., B1 3,502,645, Cl. 260-158.000.

W. P. Hickman Company, Inc.: *See*—
Hickman, John B., B1 4,071,987, Cl. 52-94.000.

LIST OF DESIGN PATENTEES

AcuBand, Inc.: *See*—
Griffith, Richard, III, 274,557, Cl. D24-99.000.

Aldred, Derek L., to Haskel Energy Systems Ltd. Multigap fume diluter. 274,509, 7-3-84, Cl. D12-194.000.

Alford, Scott J.: *See*—
Jordan, Robert L.; and Alford, Scott J., 274,525, Cl. D15-32.000.

American Home Products Corporation: *See*—
Zabel, Herbert E.; and Gruska, Casimir, 274,497, Cl. D8-93.000.

American Hospital Supply Corporation: *See*—
Perry, Matthew J., 274,553, Cl. D24-17.000.

AMF Inc.: *See*—
Grosser, Richard W., 274,538, Cl. D21-195.000.

Anthos S. A.: *See*—
Bulgari, Giovanni, 274,503, Cl. D10-32.000.

Anthos S.A.: *See*—
Bulgari, Giovanni, 274,504, Cl. D10-32.000.

Aronowitz, Robert; and Katzanek, Bernard. Stool. 274,484, 7-3-84, Cl. D6-366.000.

Artemenko, Valentin A.: *See*—
Koval, Stepan E.; Tkachenko, Oleg D.; Baranov, Vladimir V.; Kedik, Alexandr I.; Artemenko, Valentin A.; and Drozdov, Vladimir K., 274,524, Cl. D15-23.000.

Ash, Robert M. Swivel support for a snow making machine. 274,498, 7-3-84, Cl. D8-349.000.

Ballone, Michael P.: *See*—
Szostak, Jan; La Police, George; Brown, John; and Ballone, Michael P., 274,528, Cl. D15-69.000.

Bankier, Jack D. Physical exerciser. 274,539, 7-3-84, Cl. D21-198.000.

Baranov, Vladimir V.: *See*—
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LIST OF DEFENSIVE PUBLICATIONS

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Majewicz, Thomas G. Carboxymethyl hydroxyethyl cellulose as a thickener for drilling mud. T104,401, 7-3-84, Cl. 252-8.50A.

Majewicz, Thomas G. Thickening of heavy brine solutions. T104,402, 7-3-84, Cl. 252-8.55R.

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120	4,457,088
544	4,457,089
624	4,457,090

CLASS 42

1 LP	4,457,091
25	4,457,092
59	4,457,093
69 A	4,457,094

CLASS 43

25.2	4,457,095
42.42	4,457,096

CLASS 44

51	4,457,762
57	4,457,763

CLASS 47

58	4,457,102
66	4,457,103
73	4,457,104

CLASS 48

62 R	4,457,764

CLASS 49

49	4,457,105
158	4,457,106
192	4,457,107
213	4,457,108
374	4,457,109
419	4,457,110
441	4,457,111
462	4,457,112

CLASS 51

206 R	4,457,113
216 R	4,457,114
293	4,457,765
298	4,457,766
	4,457,767
328	Re.31,620

CLASS 52

73	4,457,115
94	B1 4,071,987
221	4,457,116
238.1	4,457,117
292	4,457,118
300	4,457,119
309.4	4,457,120

CLASS 53

56	4,457,121
434	4,457,122
492	4,457,123
512	4,457,124
527	4,457,125
528	4,457,126

CLASS 56

192	4,457,127

CLASS 57

23	4,457,128
284	4,457,129
328	4,457,130

CLASS 59

35.1	4,457,131

CLASS 60

299	4,457,141
384	4,457,132
524	4,457,133
612	4,457,134

CLASS 62

3	4,457,135
21	4,457,768
48	4,457,136
158	4,457,137
196.1	4,457,138
256	4,457,139
261	4,457,140
388	4,457,142
476	4,457,143
532	4,457,769

CLASS 65

3.12	4,457,770
66	4,457,771
160	4,457,772

CLASS 66

132 T	4,457,144

CLASS 68

5 E	4,457,145

CLASS 70

100	4,457,146
213	4,457,147
278	4,457,148

CLASS 71

33	4,457,773
93	4,457,774

CLASS 72

10	4,457,149
47	4,457,150
56	4,457,151
78	4,457,152
125	4,457,153
234	4,457,154
241	4,457,155
316	4,457,156
354	4,457,157
	4,457,158
422	4,457,159
446	4,457,160

CLASS 73

23	4,457,161
24	4,457,162
40.5 A	4,457,163
46	4,457,164
116	4,457,165
118	4,457,166
	4,457,167
151	4,457,168
202	4,457,169
304 C	4,457,170
305	4,457,171
462	4,457,172
510	4,457,173
598	4,457,174
606	4,457,175
624	4,457,176
626	4,457,177
636	4,457,178
701	4,457,179
756	4,457,180
861.22	4,457,181
862.18	4,457,182
862.32	4,457,183
864.11	4,457,184

CLASS 74

336 R	4,457,185
348	4,457,186
411.5	4,457,187
473 P	4,457,188
513	4,457,189

CLASS 75

0.5 B	4,457,775
6	4,457,776
51	4,457,777
	4,457,778
72	4,457,779
236	4,457,780

CLASS 76

43	4,457,190

CLASS 81

3 R	4,457,191

CLASS 82

2 R	4,457,192
3	4,457,193

CLASS 83

42	4,457,194
69	4,457,195
140	4,457,196
197	4,457,197
411 A	4,457,198
862	4,457,199
	4,457,200

CLASS 84

313	4,457,201
411 R	4,457,202
454	4,457,203

CLASS 89

1 B	4,457,204
8	4,457,205
14 R	4,457,206
	4,457,207
33.02	4,457,208
45	4,457,209

CLASS 91

355	4,457,210
446	4,457,211

CLASS 92

18	4,457,212
42	4,457,213

CLASS 98

1.5	4,457,214
103	4,457,215

CLASS 99

287	4,457,216
295	4,457,217
373	4,457,218
449	4,457,219
450.6	4,457,225
451	4,457,220
	4,457,221
494	4,457,222
510	4,457,223
516	4,457,224

CLASS 100

5	4,457,226
117	4,457,227

CLASS 101

45	4,457,228
93.14	4,457,229
110	4,457,230
230	4,457,231

CLASS 102

233	4,457,232
346	4,457,233

CLASS 104

7 B	4,457,234
104	4,457,235
138 G	4,457,236

CLASS 105

61	4,457,237
168	4,457,238

CLASS 106

109	4,457,781
266	4,457,782
288 Q	4,457,783
291	4,457,784
308 N	4,457,785

CLASS 108

109	4,457,239

CLASS 109

45	4,457,240

CLASS 110

347	4,457,241

CLASS 112

121.12	4,457,242
121.14	4,457,243
184	4,457,244
221	4,457,245
266.1	4,457,246
302	4,457,247

CLASS 114

39	4,457,248
88	4,457,249
265	4,457,250

CLASS 116

212	4,457,251
216	4,457,252
	4,457,253

CLASS 118

34	4,457,254
72	4,457,255
621	4,457,256
652	4,457,257
694	4,457,258
705	4,457,259
711	4,457,260

CLASS 119

1	4,457,261
14.47	4,457,262
17	4,457,263
58	4,457,264
148	4,457,265

CLASS 122

4 D	4,457,289
451.1	4,457,266

CLASS 123

52 M	4,457,267
90.23	4,457,268
90.31	4,457,269
90.58	4,457,270
187.5 R	4,457,271
188 M	4,457,272
193 P	4,457,273
195 C	4,457,274
339	4,457,275
	4,457,276
387	4,457,277
438	4,457,278
439	4,457,279
470	4,457,280
482	4,457,281
486	4,457,282
492	4,457,283
502	4,457,284
598	4,457,285
612	4,457,286

CLASS 124

23 R	4,457,287
	4,457,288

CLASS 126

9 R	4,457,290
21 A	4,457,291
	4,457,292
39 N	4,457,293
77	4,457,294
204	4,457,295
417	4,457,296
424	4,457,297
429	4,457,298

CLASS 128

1 R	4,457,299
20	4,457,300
92 BC	4,457,301
133	4,457,302
204.24	4,457,303
204.25	4,457,304
205.12	4,457,305
303 R	4,457,306
317	4,457,307
399	4,457,308
644	4,457,309
660	4,457,311
704	4,457,315
706	4,457,310
711	4,457,312
759	4,457,313
760	4,457,314

CLASS 130

27 Q	4,457,316

CLASS 131

96	4,457,317
276	4,457,318
336	4,457,319

CLASS 133

5 R	4,457,320
8 A	4,457,321

CLASS 134

2	4,457,322
18	4,457,323
102	4,457,324

CLASS 137

39	4,457,325
59	4,457,326
67	4,457,327
68 R	4,457,328
73	4,457,329
102	4,457,330
119	4,457,331
334	4,457,332
454.2	4,457,333
461	4,457,334
522	4,457,335
601	4,457,336
614.13	4,457,337
615	4,457,338
624.16	4,457,339
625.48	4,457,341
625.5	4,457,340
801	4,457,342

CLASS 138

45	4,457,343

CLASS 139

192	4,457,344
420 R	4,457,345
435	4,457,346

CLASS 140

92.1	4,457,347

CLASS 141

1	4,457,348
86	4,457,349

CLASS 144

117 R	4,457,350

CLASS 148

6.15 R	4,457,790
13.1	4,457,787
20.3	4,457,788
134	4,457,789

CLASS 149

19.3	4,457,791

CLASS 156

56	4,457,792
62.6	4,457,793
64	4,457,794
73.5	4,457,795
182	4,457,796
242	4,457,797
248	4,457,798
307.1	4,457,799
307.3	4,457,800
364	4,457,801
405.1	4,457,802
626	4,457,803

CLASS 160

178 R	4,457,351

CLASS 162

254	4,457,804

CLASS 164

5	4,457,352
426	4,457,353
468	4,457,354
	4,457,355
478	4,457,356

CLASS 165

21	4,457,357
50	4,457,358
80 B	4,457,360
80 C	4,457,359
84	4,457,361
104.32	4,457,362
	4,457,363
134 R	4,457,364

CLASS 166

60 4,457,365
82 4,457,366
105 4,457,367
125 4,457,369
217 4,457,368
250 4,457,370
251 4,457,374
267 4,457,371
274 4,457,372
4,457,373
309 4,457,375
332 4,457,376
4,457,377
347 4,457,378
373 4,457,379

CLASS 172

701.3 4,457,380
722 4,457,381

CLASS 173

22 4,457,382

CLASS 174

27 4,458,099
28 4,458,100
31 R 4,458,101
43 4,458,102
73 R 4,458,103
88 R 4,458,104
106 D 4,458,105
126 S 4,458,106
127 4,458,107
152 R 4,458,108

CLASS 175

4.55 4,457,383
318 4,457,384

CLASS 177

211 4,457,385
212 4,457,386

CLASS 178

22.11 4,458,109

CLASS 179

2 BC 4,458,111
18 FA 4,458,112
175.3 A 4,458,113

CLASS 180

6.48 4,457,387
9.48 4,457,388
140 4,457,389
142 4,457,390
176 4,457,392
227 4,457,393
247 4,457,394
254 4,457,395

CLASS 181

136 4,457,396

CLASS 182

116 4,457,397
151 4,457,398
164 4,457,391
185 4,457,399
234 4,457,400

CLASS 187

8.49 4,457,401
12 4,457,402
18 4,457,403
29 4,457,404
52 LC 4,457,405

CLASS 188

67 4,457,406
71.9 4,457,407
72.2 4,457,408
282 4,457,409

CLASS 192

0.052 4,457,410
0.076 4,457,411
3.28 Re.31,621
3.3 4,457,413
3.58 4,457,414
12 C 4,457,415
13 A 4,457,412
44 4,457,416
58 B 4,457,417
129 B 4,457,418

CLASS 198

345 4,457,419
369 4,457,420
396 4,457,421
604 4,457,422
619 4,457,423
747 4,457,424

CLASS 200

6 A 4,458,114
61.85 4,458,115
61.89 4,458,116
83 P 4,458,117
84 C 4,458,118
145 4,458,119
148 A 4,458,120
148 R 4,458,121
153 LA 4,458,122
159 B 4,458,123
311 4,458,124

CLASS 202

83 4,457,805

CLASS 203

9 4,457,806
72 4,457,807

CLASS 204

1 T 4,457,808
59 R 4,457,809
4,457,810
60 4,457,811
66 4,457,812
74 4,457,813
75 4,457,814
98 4,457,815
105 R 4,457,816
159.15 4,457,817
159.19 4,457,818
181 R 4,457,819
192 E 4,457,820
196 4,457,821
252 4,457,822
282 4,457,823
290 F 4,457,824
298 4,457,825

CLASS 206

38 4,457,425
158 4,457,426
229 4,457,427
232 4,457,428
394 4,457,429
459 4,457,430
491 4,457,431
503 4,457,432
505 4,457,433

CLASS 208

8 LE 4,457,826
11 LE 4,457,827
49 4,457,829
50 4,457,830
59 4,457,831
66 4,457,832
120 4,457,833
143 4,457,834
251 H 4,457,835
254 H 4,457,836
362 4,457,837

CLASS 209

223.2 4,457,838
234 4,457,839
257 4,457,840
454 4,457,841
539 4,457,434
683 4,457,435

CLASS 210

198.1 4,457,842
266 4,458,059
282 4,457,843
624 4,457,844
651 4,457,845
656 4,457,846
698 4,457,847
724 4,457,848
807 4,457,849

CLASS 211

88 4,457,436

CLASS 212

69 W 4,458,130

CLASS 215

224 4,457,437
252 4,457,438
256 4,457,439
347 4,457,440

CLASS 219

10.41 4,458,125
10.55 F 4,458,126
10.55 R 4,458,128
10.79 4,458,127
88 4,458,129
89 4,458,131
114 4,458,132
121 LG 4,458,133
121 LK 4,458,134
127 4,458,135
137 R 4,458,136
201 4,458,137
304 4,458,138
433 4,458,139
497 4,458,140
532 4,458,141

CLASS 220

5 A 4,457,441
18 4,457,442
85 S 4,457,443
213 4,457,444
214 4,457,445
224 4,457,446
306 4,457,447
327 4,457,448
445 4,457,449
455 4,457,450

CLASS 221

190 4,457,451

CLASS 222

20 4,457,452
48 4,457,453
95 4,457,454
105 4,457,455
4,457,456
146 HE 4,457,457
498 4,457,458
599 4,457,459

CLASS 224

178 4,457,460
181 4,457,461
269 4,457,462

CLASS 226

74 4,457,463

CLASS 228

57 4,457,466
103 4,457,467
124 4,457,464

CLASS 229

5.6 4,457,465

CLASS 235

381 4,458,142
449 4,458,143

CLASS 238

8 4,457,468

CLASS 239

230 4,457,470
242 4,457,471
532 4,457,472

CLASS 242

192 4,457,473
199 4,457,474

CLASS 244

3.15 4,457,475
23 C 4,457,476
97 4,457,477
155 A 4,457,478
203 4,457,479
207 4,457,480

CLASS 248

68.1 4,457,481
74.3 4,457,482
97 4,457,483
490 4,457,484
542 4,457,485

CLASS 250

204 4,458,144
4,458,145
221 4,458,146
233 4,458,147
284 4,458,148
287 4,458,149
298 4,458,150
310 4,458,151
353 4,458,152
435 4,458,153
484.1 4,458,154
572 4,458,155

CLASS 251

58 4,457,486
117 4,457,487
133 4,457,488
148 4,457,489
174 4,457,490
317 4,457,491

CLASS 252

8.5 A 4,457,853
61 4,457,850
62.63 4,457,851
78.3 4,457,852
91 4,457,854
98 4,457,855
166 4,457,856
174.21 4,457,857
182 4,457,858
299.61 4,457,859
344 4,457,860
512 4,457,861
522 R 4,457,862

CLASS 254

8 B 4,457,492

CLASS 260

112 R 4,457,863
4,457,865
112.5 R 4,457,864
4,457,866
4,457,867
158 B1 3,502,645
404 4,457,868
412.4 4,457,869
429 R 4,457,870
453 P 4,457,871
465 D 4,457,872
502.5 F 4,457,873
512 C 4,457,874
543 R 4,457,875

CLASS 261

28 4,457,876
64 B 4,457,877
111 4,457,878

CLASS 264

0.5 4,457,879
1.4 4,457,880
12 4,457,881
25 4,457,882
168 4,457,883
4,457,884
177 F 4,457,885
249 4,457,886
300 4,457,887

CLASS 266

81 4,457,493
140 4,457,494
170 4,457,495
227 4,457,496

CLASS 267

9 R 4,457,497
130 4,457,498
137 4,457,499
148 4,457,500
177 4,457,501

CLASS 269

11 4,457,502
21 4,457,503
296 4,457,504

CLASS 270

30 4,457,505

CLASS 271

3.1 4,457,506
121 4,457,507
152 4,457,508

CLASS 272

2 4,457,509
93 4,457,510

CLASS 273

82 R 4,457,511
148 A 4,457,512
411 4,457,513
420 4,457,514

CLASS 277

1 4,457,515
12 4,457,516
4,457,517
34.3 4,457,518
65 4,457,519
85 4,457,520
92 4,457,521
205 4,457,522
236 4,457,523

CLASS 280

5 A 4,457,524
4,457,525
5.26 4,457,526
47.19 4,457,527
242 WC 4,457,528
278 4,457,529
293 4,457,530
433 4,457,531
612 4,457,532
628 4,457,533
631 4,457,534
650 4,457,535
663 4,457,536
675 4,457,537
801 4,457,538

CLASS 283

81 4,457,539
94 4,457,540

CLASS 285

23 4,457,541
55 4,457,542
236 4,457,543
251 4,457,544

CLASS 290

38 B 4,458,156

CLASS 292

29 4,457,545

CLASS 293

102 4,457,546
110 4,457,547

CLASS 294

55 4,457,548
4,457,549

CLASS 296

1 S 4,457,550
4,457,558
65 R 4,457,551
78.1 4,457,552
160 4,457,553
179 4,457,554
186 4,457,555

CLASS 297

362 4,457,556
4,457,557

CLASS 299

1 Re.31,622

CLASS 301

37 P 4,457,559
4,457,560
37 SS 4,457,561

CLASS 303

6 A 4,457,562
92 4,457,563

CLASS 305

10 4,457,564
58 R 4,457,565

CLASS 307

119 4,458,157
270 4,458,158
4,458,159
306 4,458,160
400 4,458,161
456 4,458,162
466 4,458,163
519 4,458,164
595 4,458,165

CLASS 308

5 R 4,457,566
6 R 4,457,567
207 A 4,457,568

CLASS 310

71 4,458,166
166 4,458,167
185 4,458,168
315 4,458,169
322 4,458,170
330 4,458,171
334 4,458,172
338 4,458,173

CLASS 312

219 4,457,569

CLASS 313

402 4,458,174
472 4,458,175
487 4,458,176
511 4,458,177

CLASS 315

8 4,458,178
88 4,458,179
111.81 4,458,180
247 4,458,181

CLASS 318

113 4,458,182
139 4,458,183
254 4,458,184
270 4,458,185
341 4,458,186
490 4,458,187
568 4,458,188
591 4,458,189
603 4,458,190
696 4,458,191
798 4,458,192
803 4,458,193
811 4,458,194

CLASS 322

94 4,458,195

CLASS 323

286 4,458,199
316 4,458,200
317 4,458,201

CLASS 324

57 R 4,458,196
73 AT 4,458,197
133 4,458,198
204 4,458,202
309 4,458,203
326 4,458,204
345 4,458,205

CLASS 329

50 4,458,206
136 4,458,207

CLASS 330

10 4,458,208
141 4,458,209
254 4,458,210
257 4,458,211
260 4,458,212
267 4,458,213

CLASS 331

1 A 4,458,214
117 D 4,458,215

CLASS 332

9 R 4,458,216

CLASS 333

26 4,458,222
135 4,458,217
158 4,458,218
164 4,458,219
182 4,458,220
196 4,458,221
248 4,458,229
252 4,458,223

CLASS 335

16 4,458,224
35 4,458,225
205 4,458,226
222 4,458,227
229 4,458,228
271 4,458,230

CLASS 337

107 4,458,231
273 4,458,232

CLASS 338

34 4,458,233

CLASS 339

14 L 4,457,577
17 C 4,457,570
75 P 4,457,571
89 M 4,457,469
4,457,572
128 4,457,573
143 R 4,457,574
4,457,575
4,457,576
263 R 4,457,578

CLASS 340

52 R 4,458,234
310 R 4,458,236
347 AD 4,458,237
365 R 4,458,238
540 4,458,239
552 4,458,240
571 4,458,241
634 4,458,242
756 4,458,243
768 4,458,244
853 4,458,245

CLASS 343

7.6 4,458,246
368 4,458,247
719 4,458,248
754 4,458,249
768 4,458,250
914 4,458,251

CLASS 346

74.4 4,458,252
76 PH 4,458,253
134 4,458,254
140 R 4,458,255
4,458,256
141 4,458,257
153.1 4,458,258

CLASS 350

3.72 4,457,579
6.91 4,457,580
96.16 4,457,581
96.20 4,457,582
96.23 4,457,583
137 4,457,584
235 4,457,585
281 4,457,586
288 4,457,587
4,457,598

336 4,457,588
4,457,589
413 4,457,590
430 4,457,591
432 4,457,592
448 4,457,593
452 4,457,594
454 4,457,595
472 4,457,596
582 4,457,597

CLASS 352

89 4,457,599

CLASS 353

122 4,457,600

CLASS 354

80 4,457,603
145.1 4,457,604
173.11 4,457,605
4,457,606
203 4,457,607
286 4,457,608
4,457,609
293 4,457,610
415 4,457,611
416 4,457,602
418 4,457,601
471 4,457,612

CLASS 355

3 CH 4,457,615
3 DD 4,457,613
3 R 4,457,614
8 4,457,616
13 4,457,617
20 4,457,618
60 4,457,619
74 4,457,620

CLASS 356

5 4,457,621
237 4,457,622
307 4,457,623
336 4,457,624
360 4,457,625
376 4,457,626

CLASS 357

22 4,458,259
23.11 4,458,262
23.7 4,458,261
30 4,458,260

CLASS 358

4,458,263
75 4,458,264
80 4,458,265
105 4,458,266
111 4,458,267
120 4,458,268
167 4,458,269
225 4,458,270
310 4,458,271

CLASS 360

8 4,458,272
74.1 4,458,273
75 4,458,274
78 4,458,275
96.5 4,458,276
99 4,458,277
4,458,278
123 4,458,279
125 4,458,280
128 4,458,281
133 4,458,282

CLASS 361

76 4,458,283
79 4,458,284
4,458,285
91 4,458,286
103 4,458,287
124 4,458,288
139 4,458,289
152 4,458,290
212 4,458,291
283 4,458,292
288 4,458,293
321 4,458,294
322 4,458,295
383 4,458,296
403 4,458,297

CLASS 362

15 4,458,298
158 4,458,299
206 4,458,300
216 4,458,301
303 4,458,302
321 4,458,303
387 4,458,304

CLASS 363

27 4,458,306
141 4,458,305

CLASS 364

200 4,458,307
4,458,308
4,458,309
4,458,310
4,458,311
4,458,312
4,458,313
4,458,314
4,458,315
4,458,316
406 4,458,317
424.1 4,458,318
431.06 4,458,319
464 4,458,320
513 4,458,321
571 4,458,322
582 4,458,323
606 4,458,324
705 4,458,325
723 4,458,326
746 4,458,327
825 4,458,328
851 4,458,329
900 4,458,330
4,458,331
4,458,332
4,458,333

CLASS 365

1 4,458,334
8 4,458,335
149 4,458,336
185 4,458,348
189 4,458,337
201 4,458,338

CLASS 366

65 4,457,627
67 4,457,628
139 4,457,629
345 4,457,630

CLASS 367

14 4,458,339
32 4,458,340
43 4,458,341
88 4,458,342
149 4,458,343
183 4,458,344

CLASS 368

273 4,457,631

CLASS 369

103 4,458,345
126 4,458,346
270 4,458,347

CLASS 371

13 4,458,349

CLASS 372

108 4,458,350

CLASS 373

76 4,458,351
101 4,458,352
161 4,458,353

CLASS 374

14 4,457,632
209 4,457,633

CLASS 375

82 4,458,355
120 4,458,356

CLASS 376

272 4,457,888
282 4,457,889
362 4,457,890

CLASS 377

2 4,458,357

CLASS 378

19 4,458,358
22 4,458,359
25 4,458,354
50 4,458,360

CLASS 381

15 4,458,361
32 4,458,110
103 4,458,362

CLASS 382

1 4,458,235

CLASS 384

302 4,457,634

CLASS 400

124 4,457,635
4,457,636
172 4,457,637
279 4,457,638
322 4,457,639

CLASS 401

7 4,457,640
135 4,457,641
188 R 4,457,642
201 4,457,643
216 4,457,644

CLASS 404

90 4,457,645

CLASS 405

52 4,457,646
154 4,457,647

CLASS 406

175 4,457,648

CLASS 410

46 4,457,649
111 4,457,650

CLASS 411

29 4,457,651
38 4,457,652
342 4,457,653
408 4,457,654

CLASS 412

7 4,457,655

CLASS 414

31 4,457,656
45 4,457,657
114 4,457,658
223 4,457,659
331 4,457,662
332 4,457,660
404 4,457,661
522 4,457,663
779 4,457,664
786 4,457,665

CLASS 415

2 R 4,457,666
174 4,457,667

CLASS 416

95 4,457,668
119 4,457,669

CLASS 417

53 4,457,670
312 4,457,671
360 4,457,672
412 4,457,673

CLASS 418

5 4,457,674
14 4,457,675
55 4,457,676
61 B 4,457,677
4,457,678
91 4,457,679
191 4,457,680
201 4,457,681

CLASS 420

434 4,457,891

CLASS 422

2 4,457,892
64 4,457,893
73 4,457,894
179 4,457,895

CLASS 423

141 4,457,897
219 4,457,898
321 S 4,457,899
339 4,457,900
341 4,457,901
350 4,457,902
4,457,903
376 4,457,904
4,457,905
387 4,457,906
659 4,457,896

CLASS 424

7.1 4,457,907
49 4,457,908
55 4,457,909
59 4,457,910
4,457,911
73 4,457,912
88 4,457,913
4,457,914
4,457,915
101 4,457,916
177 4,457,917
180 4,457,918
4,457,919
4,457,920
206 4,457,921
224 4,457,922
226 4,457,923
243 4,457,924
245 4,457,925
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4,457,927
246 4,457,928
4,457,929
248.5 4,457,930
250 Re.31,623
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251 4,457,932
258 Re.31,624
260 4,457,933
263 4,457,934
270 4,457,935
4,457,936
272 Re.31,625
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273 R 4,457,938
4,457,939
274 4,457,940
4,457,941
317 4,457,942
322 4,457,943
358 4,457,944

CLASS 425

219 4,457,682
373 4,457,683
394 4,457,687
451.9 4,457,684
461 4,457,685
463 4,457,686
525 4,457,688
4,457,689

CLASS 426

53 4,457,945
94 4,457,946
438 4,457,947

CLASS 427

34 4,457,948
39 4,457,949
43.1 4,457,950
96 4,457,951
98 4,457,952
113 4,457,953
125 4,457,954
127 4,457,955
203 4,457,956
226 4,457,957
314 4,457,958
379 4,457,959

CLASS 428

35 4,457,960
4,457,961
36 4,457,962
4,457,963
41 4,457,981
43 4,457,964
141 4,457,965
196 4,457,980
204 4,457,966
212 4,457,967
213 4,457,983
220 4,457,984
224 4,457,985
229 4,457,968
288 4,457,969
290 4,457,970
323 4,457,971
334 4,457,972
372 4,457,973
373 4,457,974
394 4,457,975
403 4,457,982
457 4,457,976
463 4,457,977
614 4,457,979

CLASS 429

40 4,457,986
41 4,457,987
47 4,457,988
102 4,457,989
162 4,457,990
174 4,457,991

CLASS 430

49 4,457,992
54 4,457,993
59 4,457,994
98 4,457,998
115 4,457,995
122 4,457,996
160 4,457,997
191 4,457,999
4,458,000
215 4,458,001
236 4,458,002
253 4,458,003
270 4,458,004
271 4,458,005
283 4,458,006
284 4,458,007
302 4,458,008
350 4,458,009
393 4,458,010
543 4,458,011
549 4,458,012

CLASS 431

1 4,457,690
4,457,691
2 4,457,693
19 4,457,692
24 4,457,701
90 4,457,694
168 4,457,695
202 4,457,696
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4,457,698
344 4,457,699
362 4,457,700

CLASS 432

11 4,457,702
13 4,457,703
29 4,457,704
106 4,457,705
226 4,457,706

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6 4,457,708
18 4,457,707
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171 4,457,713
180 4,457,714

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43 4,457,716
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98 4,457,718
159 4,457,719
179 4,457,720
224 4,457,721
260 4,457,722
409 4,457,723

CLASS 435

7 4,458,013
4,458,014
13 4,458,015
85 4,458,016
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218 4,458,018
243 4,458,019
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CLASS 436

11 4,458,021

CLASS 440

38 4,457,724
61 4,457,725
85 4,457,726
88 4,457,727

CLASS 441

4 4,457,728
74 4,457,729
94 4,457,730

CLASS 445

2 4,457,731
35 4,457,732
36 4,457,733

CLASS 446

327 4,457,097
333 4,457,100
435 4,457,098
437 4,457,099
456 4,457,101

CLASS 464

30 4,457,734
32 4,457,735
85 4,457,736
99 4,457,737
115 4,457,738

CLASS 474

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112 4,457,740
138 4,457,741
201 4,457,742
260 4,457,743

CLASS 493

126 4,457,744

CLASS 494

15 4,457,745
47 4,457,746

CLASS 502

42 4,458,022
65 4,458,023
66 4,458,024
4,458,025
80 4,458,026
104 4,458,027
4,458,028
171 4,458,029
183 4,458,030
324 4,458,031
348 4,458,032

CLASS 521

26 4,458,033
107 4,458,034
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124 4,458,037
137 4,458,038

CLASS 523

216 4,458,039
412 4,458,040
435 4,458,041

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100 4,458,044
119 4,458,045
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476 4,458,047
557 4,458,048
595 4,458,049
726 4,458,050
779 4,458,051

CLASS 525

61 4,458,052
183 4,458,053
327.3 4,458,054
477 4,458,055
528 4,458,056

CLASS 526

88 4,458,057
129 4,458,058
292.3 4,458,060

CLASS 528

73 4,458,061
254 4,458,062
418 4,458,063
501 4,458,064

CLASS 536

16.8 4,458,065
27 4,458,066
4,458,067
91 4,458,068

CLASS 544

16 4,458,069
22 4,458,072
27 4,458,070
90 4,458,071

CLASS 546

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114 4,458,074
198 4,458,075
199 4,458,076

CLASS 548

197 4,458,077
227 4,458,078
341 4,458,079
354 4,458,080
453 4,458,081
4,458,082
478 4,458,083
4,458,084

CLASS 549

51 4,458,085
74 4,458,086

CLASS 556

465 4,458,087

CLASS 560

96 4,458,088
115 4,458,089
124 4,458,090

CLASS 562

502 4,458,091

CLASS 564

479 4,458,092

CLASS 568

378 4,458,093
947 4,458,094

CLASS 585

11 4,457,828
241 4,458,095
302 4,458,096
415 4,458,097
660 4,458,098

CLASS 604

4 4,457,747
20 4,457,748
29 4,457,749
65 4,457,750
66 4,457,751
135 4,457,752
153 4,457,753
180 4,457,754
184 4,457,755
286 4,457,756
294 4,457,757
324 4,457,758

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D2—	223	274,479	D8—	77	274,496			274,512		126	274,526			274,543		79	274,559
	415	274,480		93	274,497		338	274,510			274,527		18	274,544	D26—	26	274,560
D3—	76	274,481		349	274,498	D13—	8	274,513		145	274,529			274,545		49	274,561
D6—	366	274,482		356	274,487		10	274,514		147	274,530			274,546	D27—	51	274,562
		274,483	D9—	300	274,499	D14—	58	274,515	D16—	115	274,531		31	274,547	D30—	15	274,563
		274,484		349	274,501		67	274,516			274,532	D23—	1	274,548	D32—	31	274,564
	381	274,485		355	274,500		92	274,517			274,533		40	274,549		44	274,565
	392	274,493		438	274,502			274,518		117	274,534		58	274,550		48	274,566
	406	274,488	D10—	32	274,503		100	274,519	D19—	20	274,535		77	274,551			274,567
	476	274,489			274,504		110	274,520	D21—	13	274,536		122	274,552		56	274,568
	484	274,490		102	274,505		113	274,521		59	274,537	D24—	17	274,553	D34—	6	274,569
	485	274,491		121	274,506		114	274,522		195	274,538		36	274,554		11	274,570
	494	274,492	D12—	105	274,507	D15—	11	274,523		198	274,539			274,555		34	274,571
	525	274,486		169	274,508		23	274,524	D22—	7	274,540		40	274,556		43	274,572
D7—	43	274,494		194	274,509		32	274,525		9	274,541		99	274,557		44	274,573
	354	274,495		330	274,511		69	274,528		17	274,542	D25—	16	274,558			

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PATENTS

01 :	Re.31,619		4,457,473		4,458,144		4,457,939		4,457,466		4,457,545
	4,457,173		4,457,476		4,458,152		4,458,017		4,457,487		4,457,833
	4,457,898		4,457,510		4,458,168		4,458,112		4,457,521		4,458,126
	4,458,330		4,457,516		4,458,173		4,458,148		4,457,544	22 :	4,457,071
	4,458,350		4,457,518		4,458,175		4,458,195		4,457,646		4,457,096
04 :	4,457,049		4,457,543		4,458,187		4,458,254		4,457,654		4,457,763
	4,457,148		4,457,553		4,458,212	10 :	4,457,797		4,457,718		4,457,836
	4,457,265		4,457,574		4,458,213		4,457,809		4,457,723		4,457,844
	4,457,396		4,457,578		4,458,216		4,458,037		4,457,727		4,458,019
	4,457,431		4,457,580		4,458,217		4,458,042		4,457,733		4,458,046
	4,457,432		4,457,585		4,458,220	12 :	4,457,100		4,457,749		4,458,068
	4,457,453		4,457,599		4,458,262		4,457,106		4,457,769	23 :	4,457,408
	4,457,726		4,457,600		4,458,277		4,457,258		4,457,789		4,457,415
	4,457,761		4,457,629		4,458,278		4,457,405		4,457,795	24 :	4,457,480
	4,457,779		4,457,640		4,458,279		4,457,454		4,457,800		4,457,523
	4,457,864		4,457,647		4,458,281		4,457,455		4,457,806		4,457,735
	4,457,948		4,457,652		4,458,292		4,457,468		4,457,814		4,457,754
	4,458,087		4,457,653		4,458,318		4,457,515		4,457,847		4,457,791
	4,458,200		4,457,661		4,458,320		4,457,594		4,457,852		4,457,816
	4,458,201		4,457,673		4,458,322		4,457,747		4,457,896		4,457,942
	4,458,316		4,457,711		4,458,323		4,457,773		4,458,098		4,458,023
06 :	4,457,027		4,457,716		4,458,327		4,457,781		4,458,115		4,458,034
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	4,457,052		4,457,730		4,458,335		4,457,846		4,458,117		4,458,214
	4,457,069		4,457,734		4,458,345		4,457,883		4,458,123		4,458,288
	4,457,089		4,457,737		4,458,355		4,457,968		4,458,178		4,458,315
	4,457,091		4,457,738		4,458,357		4,458,021		4,458,198	25 :	Re.31,624
	4,457,117		4,457,741	08 :	4,457,158		4,458,149		4,458,209		4,457,025
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	4,457,165		4,457,753		4,457,624		4,458,333		4,458,293		4,457,085
	4,457,175		4,457,805		4,457,656	13 :	4,457,159		4,458,303		4,457,090
	4,457,182		4,457,825		4,458,066		4,457,260		4,458,310		4,457,241
	4,457,201		4,457,832		4,458,255		4,458,250	18 :	4,457,132		4,457,243
	4,457,202		4,457,837		4,458,274	16 :	4,457,118		4,457,179		4,457,256
	4,457,208		4,457,855		4,458,314		4,457,264		4,457,291		4,457,301
	4,457,211		4,457,894		4,458,341		4,458,282		4,457,412		4,457,359
	4,457,221		4,457,902	09 :	4,457,121	17 :	4,457,024		4,457,670		4,457,365
	4,457,273		4,457,919		4,457,213		4,457,110		4,457,678		4,457,418
	4,457,297		4,457,934		4,457,284		4,457,113		4,457,772		4,457,425
	4,457,304		4,457,941		4,457,314		4,457,115		4,458,065		4,457,426
	4,457,305		4,457,947		4,457,354		4,457,162		4,458,071		4,457,452
	4,457,323		4,457,958		4,457,355		4,457,206		4,458,085		4,457,504
	4,457,328		4,457,963		4,457,551		4,457,242	19 :	4,457,226		4,457,571
	4,457,330		4,457,969		4,457,577		4,457,267		4,457,910		4,457,618
	4,457,338		4,457,972		4,457,603		4,457,320		4,457,978		4,457,625
	4,457,349		4,458,020		4,457,617		4,457,343		4,458,058		4,457,633
	4,457,378		4,458,025		4,457,623		4,457,348	20 :	4,457,274		4,457,657
	4,457,403		4,458,059		4,457,637		4,457,374		4,457,316		4,457,664
	4,457,406		4,458,081		4,457,667		4,457,385		4,457,546		4,457,700
	4,457,416		4,458,110		4,457,712		4,457,397		4,457,907		4,457,823
	4,457,422		4,458,114		4,457,888		4,457,446	21 :	4,457,319		4,457,824
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34 : 4,457,232
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